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EKO: ECONOMICS AND ORGANIZATION
OF INDUSTRIAL PRODUCTION

No 12, DECEMBER 1985

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CHANGES IN MACHINE BUILDING SURVEYED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 3-20

[Article by V. K. Faltsman, doctor of economic sciences, professor, head of the laboratory for prognostication of investment processes of the Central Economics and Mathematics Institute of the USSR Academy of Sciences (Moscow): "Machine Building: Paths of Change"]

[Text] The national economy is setting a ramified complex of long-range tasks for machine building. "In carrying out the scientific and technical revolution," noted M. S. Gorbachev in his paper at the conference of the CPSU Central Committee regarding questions of accelerating scientific and technical progress, "A Predominant and Key Role Belongs to Machine Building." The advancement of machine building--the main direction for economic development--presupposes mobilization of reserves of the machine-building complex and a scientific approach to the selection of long-term reference points.

Growth Rates

Theory and variant calculations show that more rapid development of machine building is a necessary condition for acceleration of the intensification of the national economy. The country's powerful multibranch complex is developing at the most rapid rate. During 1971-1983 the growth output for machine building increased 3.2-fold, and its share in industrial production increased from one-fifth to one-fourth.¹

At the same time, as was emphasized at the conference of the party central committee regarding questions of accelerating scientific and technical progress, even under the 12th Five-Year Plan the growth rates must be increased another 1.5-2-fold. We are speaking not simply about accelerating growth, but about a new quality of development. With respect to machine building, this means primarily fuller physical and substantial significance in the rates of its growth.

The growth rates of machine building are usually evaluated according to the indicator of commodity output, that is, in value measurement. For individual kinds of machines and equipment the output is planned in tons, physical units, units of capacity and other physical indicators. It has been noted that the

growth rates of the output in physical terms are usually lower than in value terms. There arises the question: is the output of implements of labor in physical terms expanding rapidly enough to satisfy the needs of the national economy?

In order to answer this question it is necessary to evaluate the output of technical equipment not in value terms but in units of productivity in which the demand is measured. Up until recently we have not managed to do such a calculation because the physical units for measuring various kinds of machines and equipment were not commensurable with one another.

A special set of methods was developed for evaluating the dynamics of the output of implements of labor in units of passport productivity.² As rough calculations showed, the output of technical equipment in units of its productivity increases much more slowly than it does in value terms (see figure), and the difference between the value and the physical dynamics is increasing. By the beginning of the 1980's the quantitative difference in the rates had already become qualitative: in value terms the output of equipment continues to grow rapidly, but in units of productivity it is decreasing.

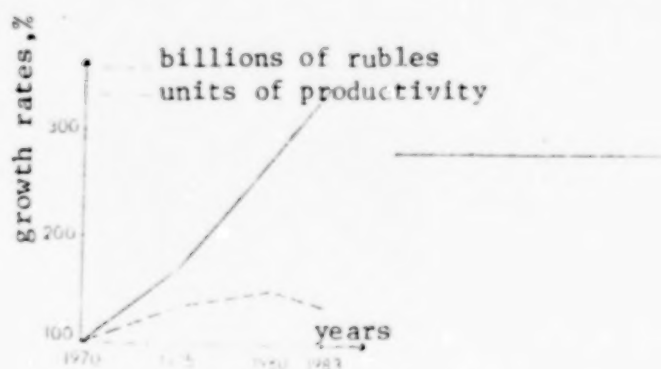


Figure. Increase of output of equipment in value measurements and in units of its passport productivity.

The output of machines and equipment in units of their productivity is thus increasing more slowly than the consumer branches are developing. In other words, investment machine building is not fully satisfying the needs of the national economy not only from the standpoint of the technical level of the implements of labor that are produced, but also from the quantitative standpoint.

As a result the load has shifted to foreign trade and sources of currency--the raw material branches. The reason for the fact that every third ruble of capital investments in equipment is covered through imports lies not only in the technical level of domestic equipment, but also in the shortage of it (translated into passport productivity) for the introduction and reconstruction of capacities.

What growth rates of machine building would be justified? The main goal dictates the dependency of the rates of its growth primarily on the speed of the increase in production capital investments, especially on investments in machines and equipment. Let us say that capital investments in machines and equipment increase by 3.5 percent per year. Then the growth rates of the output from machine building in value terms, even in view of the proposed more rapid rate of exports of technical equipment and output of consumer goods and spare parts, will not exceed 5-5.5 percent.

Now let us imagine that the dynamics of the physical-substantial content of the commodity output of machine building remains the same, that is, the ratio between the rates of increase in output in value measurement and the output of machines and equipment translated into their passport productivity remain at the level of 8:3. With an annual increase in commodity output from machine building of 5.5 percent the average annual rates of output of equipment (in units of productivity) will come close to 2 percent. Consequently, the rates of startup of production capacities will turn out to be even lower because of the accelerated updating of technical equipment and development of exports of machines and equipment. Therefore the variant of maintaining the superiority of value growth rates over fiscal-substantial ones is unacceptable from the national economic standpoint.

An alternative to this will be to improve the "quality" of the rates of machine-building output in value measurement with an improvement of the physical and substantial content of these, a rise of the technical level and improvement of its structure as well as stabilization of the investment ruble. The demand of the national economy for implements of labor will be satisfied if the rates of their output (translated into passport productivity) approach the rates of commodity output of machine building. To achieve this it is necessary for the average price of machines and equipment per unit of productivity to remain the same and not increase. An increase in the physical-substantial content of the growth rates of the production of technical equipment as the result of making it less expensive per unit of productivity thus becomes the condition for further advancement of machine building.

Understandably, the need for equipment (translated into productivity) is linked to the rates of economic growth, whereby the level of utilization of its passport productivity is fixed. But if the consumers acquire technical equipment regardless of the capabilities for its efficient utilization, no growth rates of the output of implements of labor will satisfy a demand which is in no way justified.

What motives cause users to acquire equipment even if they cannot fully load it? First among them is the violation of contractual commitments for deliveries. A lack of confidence in external cooperation gives rise to a tendency toward self-support, the limitation of external economic ties with the creation of their own repair and construction base and the departmental fleet of automotive transportation, to the acquisition of "their own" computer equipment, and to the organization of "their own" communications channels and so forth. If the fleet of equipment is formed according to the principles of economic separation it can grow beyond any reasonable limits. The utilization

of equipment deteriorates and the unjustified need for technical equipment grows.

Many facts indicate reserves in the utilization of machines and equipment. With a nominal annual fund of working time of 4,000 hours (two-shift work) and 6,000 (three-shift) the energy capacity of a unit of domestic equipment installed in industry a decade and a half ago was loaded by an average of 1,600 hours per year.³ Since that time the situation has not changed radically. The losses from poor utilization of costly new equipment are especially great: machine tools with numerical program control, robots, costly imported equipment and so forth.

Hence the conclusion that machine building will be able to satisfy the needs of the national economy only if measures are taken to increase the responsibility of the users for the planned level of utilization of technical equipment. These measures include strengthening of delivery discipline and planning discipline, and consistent realization of the principles of specialization and cooperation which make it possible to limit an unjustifiably high demand for technical equipment for interbranch youth. We are also speaking about increasing the influence of payments for funds on the formation of the production potential, the role of credit in financing expenditures for the acquisition of technical equipment, bank control and administrative-legal responsibility for its utilization.

Improvement in the work of funding organizations (USSR Gosstab, State Committee for Material and Technical Supply and others) can play a role in improving the utilization of machine-building products, particularly improvement of methods of developing balances and plans for the distribution of machines and equipment. But the possibilities here are limited first of all by equipment that is not included in the estimates for construction projects. As concerns providing capital construction with technological equipment, here the planning agencies usually end up having to allot funds for equipment for production areas that are practically prepared. The decision concerning the expediency of the allotment of technical equipment is made not at the time of the distribution of the funds, but much earlier--during the course of expert evaluation and approval of the drafts, estimates and plans for capital construction. In these stages too it is necessary to wage a battle for efficient utilization of machines and equipment.

Elimination of the artificial shortage creates prerequisites for changing the relations between the supplier and the consumer of the implements of labor and for subordinating the activity of the creators and manufacturers of machines to the interests of the consumers and, on the basis of this, improving the quality of new technical equipment.

Technical Policy

One condition for accelerating the growth of machine-building output in physical-substantial terms should be a new technical policy which combines a higher technical level of machines and equipment with mainly a reduction in cost per unit of productivity. This is a stricter requirement than that of reducing the costs of machines per unit of useful effect. Is it feasible?

One may doubt this at first since the growth of productivity accounts for an average of only about one-third of the economic effect from new technical equipment. The other two-thirds are related to economy of fuel and energy for the consumer, increased reliability, suitability for repair, ergonomic and other operational indicators of machines and equipment. If one is to introduce the indicator of the price of the machine per unit of its productivity into the major characteristics of the quality of machine-building products will this not lead to a reduction of its technical level?

Possibilities of reducing the costs of machines and equipment per unit of productivity was a simultaneous improvement of their operational quality are opened up by the differentiated approach to raising the technical level of new technical equipment and an orientation toward the needs of the user. Such a technical policy presupposes a rational type structure of the equipment that is produced and the creation of specialized technical equipment on a module basis whose characteristics correspond fully to the operating conditions. We are speaking, for example, about increasing the output of trucks with small cargo capacities which are needed for shipping small cargoes; cutting-off, thread-cutting and other narrowly specialized lathes whose operating space is closer to the sizes of the worked parts than is that of large universal metal-cutting equipment; small construction equipment for work inside buildings, and so forth. In all such cases the technical equipment can turn out to be much less expensive, and the results of its operation are better.

In individual cases a differentiated approach to the quality of technical equipment can mean that it will also become more expensive--if, for instance, one is speaking about manufacturing machines for use in the Far North or in the tropics. But then there is a smaller overall demand for the machine-building products because of their increased reliability. Both the consumer and the national economy stand to gain. A condition for making machine-building products less expensive is the coordination of the output and delivery of costly automated equipment (machine tools with numerical program control, robots and so forth, and also imported equipment) with the economic, technical and organizational prerequisites for their effective utilization.

Another approach is also possible: the orientation of the output of technical equipment exclusively toward the maximum indicators. This variant is economically justified only for individual kinds of machines and equipment, and sometimes it leads to inefficient utilization of the scientific and production potential of machine building and gives rise to surplus quality of certain kinds of technical equipment while leaving others further behind. A result of such a technical policy can be further increased cost of the equipment. Therefore this variant does not correspond to the task of accelerating the growth of machine-building output in physical-substantial terms.

Of course scientific and planning-design developments should be maintained on the leading edge. As M. S. Gorbachev emphasized in his report at the conference of the CPSU Central Committee, it is absolutely inadmissible for newly created technical equipment to turn out to be obsolete even in the stage

of designing and to lag behind the best models in terms of reliability, work resource and economy.

International machine-building exhibits and trade fairs usually take place under the banner of innovations. At exhibitions of metal-cutting equipment, for example, the machine tools that are displayed, as a rule, are equipped with numerical program control. This certainly does not mean, however, that the firm and its consumers deal only with these machine tools. On request from the client the manufacturer is ready to deliver the simplest and least expensive modification of the machine tool.

While advancing the cost of equipment per unit of productivity to one of the priority indicators of the quality of machine-building products it is also necessary to keep in mind the additional possibilities of reducing costs of technical equipment as a result of improving its productivity. Thus reducing the cost of machines and equipment depends essentially on progressive changes in the direction of resource-saving technologies as well as specialization, unification and series production of machine-building products.

Planned price setting cannot always stop the growth of prices for unique machines. Prices of nonstandard equipment manufactured by the enterprises that use it can actually not be controlled. They take advantage of this sometimes so that by increasing the output of expensive and not always necessary equipment they can raise the level of fulfillment of the plan for the basic activity.

As concerns series and mass-produced machine-building products, here the prices are strictly regulated and there can be no unsubstantiated growth of profitability. Therefore the rates of output of commercial products and the actual expenditures on their production are coming closer together in the machine-building ministries.

According to the existing methods the "ceiling" for the growth of prices is set by the economic effect of the new technical equipment. Theoretically this is all correct. But in practice the weakness of the approach lies in the fact that the "ceiling" is quite arbitrary. Manufacturers try to raise it as expenditures for the manufacture of technical equipment increase. The consumer does not especially object since the effect from the technical equipment he acquires is not established in his plan. The theoretical effect exceeds the actual effect severalfold. And so it turns out that this method of price setting provides for profitability of production with any increase in outlays, even if they are not socially necessary.

An analysis of the elements of expenditures on the production of machine-building products discloses large reserves for making them less expensive. One should begin with the fact that in the 1970's the increase in expenditures in the machine-building ministries of approximately two percentage points per year was greater than the increase in labor productivity. Fixed production capital in machine building increased rapidly and amortization deductions per unit of productivity of the equipment that was produced increased almost 1.5-fold during the 5 years.

The experience of the leading machine-building enterprises confirms the possibilities of reducing the material-intensiveness per unit of productivity of equipment and the possibilities of achieving the kind of growth of labor productivity which would compensate not only for higher wages, but also for amortization deductions. The evaluations of Soviet specialists and also foreign experience show that one can put a stop to the rising costs of machine-building products along with increasing the reliability of machines and equipment, their economy, their ergonomic indicators and other consumer qualities and also achieve a reduction of the cost of technical equipment per unit of productivity.

A higher technical level of machines and equipment with a simultaneous relative reduction in cost is a fundamental prerequisite for rapid updating of technical equipment and production technology. At the same time this is also a means of increasing the ability of domestic machines and equipment to compete and to expand their export which, as was noted at the conference of the CPSU Central Committee, have been increasing slowly in recent years.

Structural Policy

The structural policy in machine building during the course of intensification of the national economy should be oriented toward economy of live labor through comprehensive mechanization, automation of production processes and economy of energy and other material resources.

It was pointed out at the conference of the CPSU Central Committee that saving resources is becoming one of the major areas of the investment policy. But unless special measures are taken a progressive structural policy can come up against serious obstacles from construction and planning-design stockpiles in machine building.

Thus comprehensive mechanization of labor is impeded by the conservative structure of the construction stockpiles for producing lifting and transportation equipment. Most of them are for cranes, conveyors and certain other kinds of equipment whose further increased production will not solve the problem of mechanization of lifting-transportation and warehouse work.

In order to mechanize construction work it is necessary to rapidly increase the proportion in machine-building products of specialized construction equipment for reconstruction and technical reequipment of existing production where the proportion of manual labor is high and also to expand the output of mechanized instruments. But the stockpile capacities are oriented toward the output of earth-moving machines even though the mechanization of earth-moving work has been practically completed. The proportion of stockpile capacities for the output of machines for finishing, roofing and other less mechanized work does not exceed a couple of percentage points.

In agricultural machine building it is necessary to achieve more rapid output of those machines which make it possible to overcome the lack of uniformity in the mechanization of agricultural work. Yet the majority of our construction stockpiles for agricultural machine building are oriented toward increasing

the production of technical equipment for highly mechanized processes (harvesting grain crops, planting work and so forth).

The stockpiles that have been formed in machine building--both in planning-design work and in construction--are oriented primarily toward the creation of technical equipment for expanding fuel and energy resources. They do not fully correspond to the tasks for accelerated output of equipment for increasing the yield from petroleum beds and deep processing of petroleum, or the use of diesel fuel in transportation and for other energy-saving measures. The planning-design stockpile of technical equipment for resource-saving technologies, the processing of secondary resources and household wastes, and for purification installations is quite inadequate.

Increasing the Mobility of Machine Building

In view of the tasks of the structural and technical policy increasing the mobility of machine building becomes especially important. This presupposes:

acceleration of the renewal of the production apparatus of machine building with an increase in the coefficient of removal of fixed capital at least up to 3 percent per year as compared to the existing 1-1.5 percent. Additionally, each year no less than 2-3 percent of the existing fleet of metal-processing equipment should be updated; and reconstruction of machine building, as was pointed out at the conference of the CPSU Central Committee, should be given priority;

to reduce the time periods for the creation of machine-building productions to no more than one-half-one-third as a result of concentration of capital investments, reduction of the proportion of the economic method of construction, specialization of contracting organizations in large machine-building centers for reconstruction and technical reequipping of enterprises;

acceleration of the updating of machine-building products: in increased quantity of new models of equipment, and adjusting the ratio between the quantity of models of machines assimilated by production and those that have been newly developed (in the 1970's this increased from 32 to 74 percent).

Technical reequipping of machine-building production should be based on the most modern technical equipment--equipment with program control, including machine tools of the processing center type, industrial robots, flexible automated production systems (GAP's) and so forth. But it makes sense for the machine-building enterprise to acquire this costly equipment only if it can be used on two-three shifts. It is also necessary to keep in mind that reequipping production with GAP systems for mechanical processing of metal can contribute to maintaining the existing technological structure and make it difficult to extensively utilize reduced-waste technologies--pressure processing of metal, precision casting and so forth.

Automation of basic production should not divert attention away from mechanization of auxiliary processes. In machine building in the auxiliary production the level of mechanization is less than half of what it is in the basic production. For the majority of machine-building ministries the degree

of mechanization of labor in lifting and transportation work (the proportion of the number of workers handling machines and mechanisms) is at the level of 50 percent, in the Ministry of Tractor and Agricultural Machine Building--34 percent, and in the Ministry of the Light and the Food Industry--25 percent. Yet the release of one worker from auxiliary production requires one-third-one-fourth the expenditures required in basic production.

The Organizational Structure of Machine Building

There are also possibilities of raising the technical level of machines and equipment with a relative reduction of their cost in improving the organizational structure both of domestic machine building and of machine building in countries of the socialist community.

A large step in deepening international division of labor in the production of machines and equipment was earmarked at the high-level economic conference of the CEMA countries in 1984. Today, as was noted at the conference, questions of technical progress in machine building are acquiring not only economic, but also special political significance. Therefore attention should be concentrated not on maintaining the existing distribution of the output among countries, but on the creation of progressive machines, equipment and instruments.⁵ It is necessary to wage a decisive battle against the output of machines and equipment which do not reduce but increase the number of jobs, which do not curtail but increase the demand for raw material, fuel and energy.

The development of domestic machine building for a long time proceeded primarily along the path of increasing the sizes of complex enterprises, which led to excessive concentration of production. The future of the organization of machine-building production can be seen not in increasing the sizes of the enterprises but in efficiently combining large, medium-sized and small highly specialized productions as parts of associations.

Research of the Institute of Economics of the USSR Academy of Sciences⁶ gives a complex of measures for improving the organizational structure of machine building and developing specialization and cooperation. Among them are:

redistribution of capital investments in favor of machine-building ministries which are responsible for satisfying the needs of the national economy for technical equipment; an increase in their share of the creation and development of capacities for producing specialized equipment, fittings and spare parts;

regulation of the growth of the fleet of metal-cutting equipment, and reduction of the machine tool fleet outside of basic machine building by approximately half. This presupposes a radical improvement of the structure of the output of metal-cutting equipment, and improvement of its quality and technical level as well;

economically expedient concentration and specialization of capital repair of equipment, the output of spare parts, replacement units and parts (both for repair and for modernization), the development of repair by the manufacturing

firms, the organization of machine service either by the manufacturers of the equipment or by specialized enterprises and services;

the completion of the system of interbranch machine-building production; during the course of 5-10 years it could concentrate on the output of blanks, fasteners, hydraulic equipment and other items for general machine-building application;

the transfer to machine-building enterprises, associations and ministries--because of the complication of the technical equipment that is produced--of batching, assembly and installation of equipment, the delivery of systems of machines and complexes of them, startup and adjustment, and the running of equipment until it reaches its planned productivity with the guarantee that the equipment will operate at the level of its planned capacity.

In Soviet machine building we have experience in the creation of a highly specialized branch--the bearing industry. A high level of unification and the mass nature of production makes it possible for enterprises of the branch to provide machine building with high-quality and inexpensive antifriction bearings. The positive experience in the production of bearings is far from being the only form of highly effective organization of production.

Domestic and foreign experience show that under certain conditions, in addition to narrow object specialization, object diversification is also efficient. Thus an automotive plant can produce technically improved, inexpensive refrigerators and pens which are in demand, an aircraft plant can produce narrowly specialized metal-cutting machine tools, and not only for their own needs, but also for other enterprises and branches.

Depending on the distribution of the consumers of machine-building products, labor resources and resources of metal, it can turn out to be justified to use a form of specialization whereby the peripheral narrowly specialized enterprises deliver parts and components for the head assembly plant. Under other conditions it makes sense to organize the production of most of the parts and components of the head enterprise, and have the peripheral plants assemble the prepared machines.

In the production of castings and other products for general machine-building use, in addition to the territorial form of specialization (in the territorial production unit), vertical specialization is also efficient for the organization of production, when the specialized enterprise serves an entire branch. Attention should be given to the proposal of Academician A. I. Tselikov concerning a gradual transfer of many machine-building metallurgical shops to metallurgical plants with the development of foundries for machine building.

The diversity of organizational forms and conditions for production makes it impossible to formulate at the national economic level simple recommendations for improving the organizational structure of machine building. The best forms of organization of machine-building production and its concentration, specialization and cooperation are selected according to the conditions of its activity at the level of variant calculations.

Improvement of the economic mechanism opens up new horizons for machine building. During the course of the large-scale experiment it would make sense to develop a system of measures which orient machine builders toward the satisfaction of the needs of consumers in terms of the quantity and quality of implements of labor. We should increase the role of machine building enterprises in cooperation with consumers in the selection of economic equipment and batching items. By analogy with export circumstances the prestige of machine builders should be increased, depending on the indicators of the effectiveness of the enterprises that provide equipment for their production. The time has come to implement the decision concerning the expansion of the rights of the ministries and associations for the development of international production cooperation on the basis of direct ties.

A Resource-Saving Policy

The normative requirements for the resource-saving policy in machine building presuppose an increase in the output without additional labor resources or metal, but with a considerable increase in capital investments. A radical restructuring of machine building and metallurgy is necessary: a rapid increase in the proportion of economical kinds of metal products and plastics, large-scale positive changes in the fleet of metal-processing equipment, a 4-6-fold increase in the level of automation and robotization of production processes, and so forth.

What results can be expected from such a restructuring? Obviously the average proportional expenditure of ferrous metals per unit of productivity of equipment will decrease by 25-30 percent, and the coefficient of the utilization of metal will simultaneously increase from 0.74 to 0.9. One can judge the difficulty of such a program from the fact that during the preceding 15 years the design metal-intensiveness of machines (calculated per unit of productivity), according to calculations, has decreased by only 12 percent, and the coefficient of the utilization of metal has almost not changed.

Such a variant of the resource-saving policy means the development of machine building without bringing in additional resources of rolled metal with the average annual rates of increase in the output of equipment (translated into its passport productivity) not exceeding 3.7 percent. Yet the need for the national economy, as was already stated, presuppose higher growth rates. In order to achieve these it will apparently still be necessary to increase the deliveries of ferrous metals to machine building.

Moreover it will take a certain amount of time to complete the radical restructuring of machine building and metallurgy. Therefore during the next few years machine building will need additional resources of metal and labor force.

Nonmachine-building branches hold potential reserves of resources. In order to save metal here and release machine tool operators, even under the 12th Five-Year Plan machine building will have to take responsibility for repair provided by the manufacturer as well as the manufacture of spare parts and nonstandard equipment.

Another source of metal is to be found in increasing the production of prepared rolled metal. Of course economizing on metal is the main reserve of resources for machine-building production. But it would be incorrect to orient the development of metallurgy toward growth of quality indicators alone, ruling out any expansion of the output of metal which is needed by machine building if only until the completion of its radical restructuring. Such a policy, on the one hand, would weaken the amount of attention paid to the raw material base of metallurgy and, on the other, would lead to a failure to save the technically possible amount of metal that can be saved because of the unpreparedness of machine building.

The advancement of machine building presupposes an increase of its share in production capital investments. The draft of the Basic Directions for the Economic and Social Development of the USSR During 1986-1990 and the Period Up to 2000 envisions: "essentially increasing the volume of capital investments in the development of the machine-building complex. To increase the updating of the active part of fixed production capital to 10-12 percent annually." But the possibilities of interbranch redistribution of capital investments in favor of machine building are not great without a special program of measures. Of course there are reserves of capital investments in branches of the national economy and they are considerable.

The impulse for interbranch redistribution of capital investments should proceed mainly from machine building itself. We are speaking about economizing on capital investments in the branches that consume the equipment as a result of making its per-unit productivity less expensive, increasing its reliability and developing repair and the output of spare parts by the manufacturer.

Among the priority areas for the distribution of capital investments in machine building one can single out those such as the development of the material and technical area, including the experimental design base for scientific research and experimental design work; the science-intensiveness of the production of batching items, including electrical equipment, instruments and microprocessors; machine tool building, repair and the output of spare parts by the manufacturing firm and other forms of specialization; and mechanization of labor in auxiliary work and productions in machine-building branches.

The distribution of additional capital investments in machine building presupposes a rejection of the line of extensive expansion whereby the increase in the output of products is achieved as a result of constructing new plants. Restructuring means not the creation of new machine building along with that which already exists, but reconstruction and technical reequipment of existing production.

FOOTNOTES

1. "The USSR National Economy in 1983," Moscow, "Finansy i statistika", 1984, pp 126, 160.

2. The dynamics of the output of machines and equipment in units of productivity and their measurement in terms of their total energy capacity. These were calculated as the sum of the capacities of diesel and electric engines, transformers and other power equipment used for batching manufactured instruments of labor. This method makes it possible to measure the passport productivity of the majority of kinds of equipment--electrical and transportation means (steam engines, electric engines, trucks and so forth), tractors, self-propelled agricultural equipment, mining and drilling equipment, rolling mills, metal-cutting machine tools and forge-press machines.
3. Kvasha, Ya. B., "Rezervnyye roshchnosti" [Reserve Capacities], Moscow, "Nauka", 1971, pp 121, 125.
4. The requirement for differentiation of quality depending on the individual demands of the user stands in contradiction to unification and increased series production of machine-building products. Additional difficulties arise because of the increased proportion of capital investments for reconstruction and technical reequipment. Reequipment of existing capacities that have been put into operation at various times requires machines that are individually made and frequently does not allow the application of the latest technical equipment. The problem of the best combination of mutually contradictory requirements can be resolved in one concrete case or another on the basis of a comparison of the economic effectiveness of various variants.
5. PLANOVOYE KHOZYAYSTVO, 1984, No 10, pp 6-7.
6. Kheynman, S. A., "The Development of Machine Building: Organizational and Structural Factors," EKO, No 6, 1984; Palterovich, D. N., Shukhgalter, M. L., "Tendentsii razvitiya troizvoditelnogo apparata mashinostroyeniya SShA" [Tendencies in the Development of the Productive Apparatus of Machine Building in the United States], Moscow, NIIMash, 1983.

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NEW VIEWS ON LABOR ORGANIZATION RELATED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 21-37

[Article by Ye. L. Manevich, doctor of economic sciences, professor, Institute of Economics of the USSR Academy of Sciences (Moscow), a discussion: "The Economic Mechanism and the Utilization of Labor Resources"]

[Text] Domestic economic literature devotes a great deal of attention to the problem of overcoming the growing shortage of labor resources in the country's national economy. As we know, for the first time in history socialism has made a reality of man's greatest right--the right to work--and has put an end to unemployment forever, which is an immense advantage of the socialist way of life. Does this mean that socialism inherently contains the opposite feature--a systematic shortage of labor force?

Marxist-Leninist economic sciences answers this question in the negative: the planned system of socialist management contains all of the prerequisites for a balance of the need for labor force and the labor resources. But in practice this balance has not yet been reached and the so-called "shortage of labor force" has spread to many branches of industry, transportation, construction, agriculture and the sphere of services, and it is being felt in a number of regions of the country.

Reasons for the Shortage

The shortage of labor force in the national economy is explained by many factors. Among them are the constant expansion of the front of capital investment, the annual startup of several hundreds of large industrial enterprises, the assimilation of new regions and the rapid expansion of the nonmaterial sphere--the increased number of people employed in education, science, public health, trade, public catering, housing and municipal services and the sphere of consumer services. Because of the higher standard of living in rural areas the process of urbanization has slowed up appreciably: the increase in the number of workers and employees as a result of the release of workers from agriculture has dropped from 2 million in 1960-1970 to 1.4 million in 1971-1981. There has been a sharp reduction in the number of people employed in housework and private subsidiary farming. The number of people studying in secondary general educational, vocational-technical and

technical schools and also higher educational institutions is increasing-- compulsory universal secondary education has caused youth to begin their labor activity later in life.

A significant cause of the shortage of labor resources are the shortcomings in the accounting for the available labor resource when planning new construction and creating new jobs. Here one can see the effect of the traditional policy for capital investments: for many years attention was concentrated not on accelerating the renewal of fixed production capital and replacing worn-out and obsolete technical equipment, but on increasing production capacities by enlisting additional labor force. According to data from selective investigations of the USSR Central Statistical Administration, one-fifth of the new industrial enterprises which have not assimilated their production capacities on time have experienced a shortage of skilled personnel. The rates of increase in jobs in many regions exceed the rates of growth of labor resources which in turn gives rise to an immense number of vacancies: in branches of the agroindustrial complex alone in 1983 there were 8.6 million of them.¹ The disbalance between available labor resources and the need for them has arisen in industry and other branches of the national economy as well.

During the 1980's the dynamics of labor resources are being influenced more and more strongly by the demographic situation: a marked slowing up of the growth of the population of working age because of the reduction of the birth rate which began in the 1960's. Even during this decade (1981-1990) the population growth is decreasing to 3.8 percent as compared to 18 percent in 1971-1980. The growth of the number of workers and employees has dropped from 24 percent in 1961-1965 to 17 percent in 1966-1970 and 10 percent in 1976-1980.³

The age structure of the population has a marked influence on labor resources. The fact is that the proportion of people employed in public production is not the same in various age groups. The age structure will have a negative effect on the number of economically active population during the second half of the decade of the 1980's: the proportion of the population of working age will decrease under the 12th Five-Year Plan. The influence of the changes in the age structure on the formation of labor resources is reflected in the increased proportion of the population older than working age as a result of the process of aging.

But the fundamental reason for the shortage of labor resources in the national economy, it seems, is the fact that the utilization of the labor force in public production is not effective enough. Overcoming the "shortage" presumes a real interest on the part of the enterprises, associations and ministries in economizing and efficiently utilizing labor. But the existing system of management encourages the leadership of enterprises to expand the number of workers, engineering and technical personnel and employees. Every enterprise (association, ministry, department) tries to keep as large a staff of workers as possible. In many cases the enterprises and associations manage not only to retain available personnel (or limits) on workers and employees, but also to increase it.

Enterprises are interested in keeping workers, engineering and technical personnel and employees "in reserve" because, in the first place, such a reserve makes it possible to fulfill the plan in spite of the temporary assignment of workers and employees for agricultural, construction and other jobs. In the second place, a reserve of labor force comes in handy when the planned assignment and the list of output of products is revised. In the third place, a reserve is even more necessary because of the increased shortage and the turnover of labor force. In the fourth place, a reserve of labor force carries the enterprise through when, because of interruptions in material and technical supply and other reasons, the production rhythm is disturbed and the plan has to be fulfilled in the last 10 days of the month or the last month of the year. In the fifth place, the desire to maintain a reserve of labor force is frequently brought about by the low intensiveness of labor and large losses of working time, including because of turnover, absenteeism and idle time. A reserve of labor force makes it possible for the enterprise to "compensate" for losses of working time. In the sixth place, the wage fund and the amount of bonuses (for the introduction of new technical equipment, for winning in the socialist competition) and in machine building the salaries of management and engineering and technical workers depend on the number of workers and employees. And, finally, in the seventh place, the ingrained practice of planning "from the level achieved" gives motivation to increase (or at least retain) the number of workers.

This is why at the enterprises they strive to maintain the number of workers and employees (in some years just the planned number of workers and employees exceeded the number in the national economic plan by 2.0-2.5 million).⁴ For the same reasons in industry, construction, transportation and agriculture they are experiencing a quite real shortage of labor force.

Inefficient distribution and utilization of labor force is reflected in the entire economic situation: the effectiveness of the utilization of production capital and capacities decreases, equipment stands idle, it is difficult to provide for two-shift operation and so the coefficient of shift work in industry drops, construction is drawn out and so the amount of incomplete construction increases, labor turnover increases and labor and production discipline become weaker. Frequently the managers of the enterprises enter on the path of "enticing" workers, using legal and illegal means for this ("withdrawing" earnings directly from writeups and reductions of norms, introducing fabricated systems of bonuses, and taking a tolerant attitude toward violators of discipline, drunks and truants).

As practice has shown the situation with the utilization of labor force did not change with the introduction of "limits" on the number of workers and employees. The number of ministries, associations and enterprises which maintain above-plan numbers of workers and employees even increased.

The growing shortage of labor resources explains to a certain degree why for many years the release of workers has taken place so slowly even as labor productivity has been increasing.

As we know, the release of labor force is a direct and mandatory result of the development of productive forces and the increase in labor productivity. As

new technical equipment is introduced, the organization of production is improved and the organization of labor improves employees are released since manual implements of labor are replaced by highly productive machines and systems of them, automated lines and so forth. The point in introducing new technical equipment and technology is to replace manual labor with machine labor, to facilitate labor and to increase its productivity. Herein lies the effect of the general economic law of releasing labor force.

It is precisely the release of workers along with the enlistment in public production of youth who are reaching working age that serve as the main source of labor force. Planned release of workers, their retraining and efficient utilization of them constitute the main path to overcoming the shortage of labor resources.

During the years of socialist construction many millions of workers were released from agricultural production. The ratio between the urban and rural population changed: while in 1940 the proportion of urban population was 32.5 percent, in 1984 it was 64.8 percent.

The number of urban population increased from 63.1 million in 1940 to 177.5 million in 1984. There was a corresponding reduction in the proportion of people employed in agriculture: from 54 percent in 1940 to 20 percent in 1983. In industry and construction the employment increased from 23 to 39 percent, in transportation and communications--from 5 to 9 percent, and in public health, education, culture, art and science--from 6 to 17 percent.

But the modern scale of the release of labor force in the national economy does not correspond to the possibilities and the objective necessity. It is being held up first and foremost by serious shortcomings in the economic mechanisms which impede technical progress and the introduction of new technical equipment. In many branches of the national economy the proportion of outdated equipment is great.

The release of labor force is possible mainly because of the reduction of manual labor. Yet because of the inadequate level of mechanization and automation of production in the national economy the number of people employed in manual labor, including heavy labor, is still great. Thus in industry the rates of reduction of the proportion of manual labor show a tendency toward a certain decrease, but the absolute number of people employed in manual labor is still great. During 1959-1979, with an absolute increase in the number of people employed in mechanized labor of 2.5-fold, the number of people employed in manual labor increased by 42.3 percent; in construction the number of people employed in mechanized labor increased 4.2-fold but the number of people employed in manual labor increased by 26.3 percent.⁵

As practice shows the release of workers and employees depends on more than just the introduction of new technical equipment and the replacement of manual labor with machine labor. Thus during 1951-1983 fixed production capital in USSR industry increased more than 20-fold. But such a significant growth of fixed capital had little effect on the release of workers--at many enterprises there was a so-called conventional, but not an actual release of them and in

these places, as before, they employed more workers, engineering and technical personnel and employees than were necessary for production.

What should be done in order to radically improve the distribution and utilization of labor resources?

Restructuring of the Economic Mechanism

The solution to the problem cannot be separated from the fundamental task of increasing the economic effectiveness of public production. Economists--scholars and practical workers--are familiar with various views about the way to overcome the shortage of labor force and increase the effectiveness of socialist production. These opinions can be reduced to two main areas.

One of them is represented by those scholars and managers who, still bound by inertia and accustomed to old ways, exaggerate the effectiveness of administrative methods of management. They think that complicated economic problems, including the problem of distribution, redistribution and utilization of the labor force, should be solved by methods of administrative influence and not by economic means.

The author shares with the majority of Soviet economists the viewpoint that it is not only and not so much administrative methods of solving large-scale problems in the development of the national economy that are inherent in socialism. A major role in the further advancement of the Soviet economy is played by improvement of the economic mechanism.

This is the way the task was formulated at the April (1985) Plenum of the Party Central Committee: regardless of what issue we may consider or the side from which we approach the economy, in the final analysis everything rests on the need for serious improvement of management and the economic mechanism as a whole.... When developing the centralized basis for solving strategic problems in the future as well it is necessary to move more boldly along the path of expanding the rights of enterprises and their independence, introducing cost accounting [khozraschet] and, on the basis of this, increasing the responsibility of the labor collectives for the final results of their work.⁶

Indeed, life has shown that the changeover earmarked by the party to intensive development of the socialist economy and the solution to the problem of efficient utilization of labor resources and great productivity of public labor presupposes a radical change in the economic mechanism. This is why the decree of the CPSU Central Committee and the USSR Council of Ministers, "On Additional Measures for Expanding the Rights of Production Associations (Enterprises) of Industry in Planning and Economic Activity and Strengthening Their Responsibility for the Results of Their Work" (July 1983) takes note of the need "to carry out a system of additional measures for expanding the rights of production associations (enterprises) in planning and economic activity and providing for their true economic motivation to achieve high production effectiveness and increased responsibility for the results of the work."

What are the immediate tasks in improving the economic mechanism? Let us concentrate attention on improving planning, changing the policy for distribution of profit and improving the system of wages.

Improving the System of Planning

It is mainly the forms and methods of planning that are in need of a central improvement.

This includes the once-necessary insistence on the fulfillment and overfulfillment of the production plan--"no matter what." At the time when industry was just being created in our country, especially during the years of the Great Patriotic War, this was justified. But now when developed socialism has created quite different conditions the task consists in achieving an increase in high-quality products that are necessary to the society. And the fulfillment of the plan "at any price" causes harm to the national economy and contributes to the practice of abuses, writeups as well as material, labor and moral losses.

The evaluation of the activity of collectives of enterprises and their leadership in terms of the fulfillment of the plan and "planning from what has been achieved" forces the manager to maintain reserves and to conceal them until such time as there arises a danger of failing to fulfill the plan, it encourages extravagance, it stimulates the output of costly products, it encourages the maintenance surplus personnel and it provides motivation to increase the wage fund. Overcoming this practice has become a crucial problem.

At the all-union scientific and practical conference entitled "Improvement of Developed Socialism and Party Ideological Work in Light of the Decisions of the June (1983) Plenum of the CPSU Central Committee" (December 1984) it was noted that during the course of drawing up the plan for the 12th Five-Year Plan there was occasion to come up against the desire of a number of ministries, associations and enterprises to obtain the greatest possible quantity of capital investments and other resources and at the same time to achieve minimal assignments for the output of products and the growth of labor productivity. Such a situation ends up in losses of time and rates which are difficult to make up.

There is no doubt that rejecting the outdated system of planning and evaluation of economic activity will contribute to eliminating writeups from below to above and overcoming the factors of "adjusting the plan" as one of the widespread variants of "legitimate" writeups.

As was previously the case, in planning there are many compulsory indicators, and the number of them has increased in recent years. The overall number of planning indicators compulsory for the five-year plans for economic and social development of industry, associations and enterprises has reached 20. In addition to these there are also a large number of indicators in the annual plans--28. Numerous compulsory planning indicators restrict the independence of the enterprises, reduce personal responsibilities for their leadership and create prerequisites for planning, production and labor discipline violations.

The practice of socialist management demonstrates the real possibility of rejecting the unjustifiably complicated system of planning and management on the path to expanding the rights of enterprises on labor collectives. Instead of the constantly multiplying number of planning and report indicators, for centralized planned management of the socialist economy several key indicators are sufficient.

The decree of the CPSU Central Committee and the USSR Council of Ministers concerning conducting the large-scale experiment for expanding the rights of enterprises (1983) limits the number of indicators set in the five-year plan for production associations and enterprises. The evaluation of the economic activity is given according to the fulfillment of planned assignments for the sale of products in keeping with agreements that have been concluded.

Distribution of Profit and Income Tax

The second key element in the restructuring of the economic mechanism is a change in the system of distribution and utilization of profit.

As we know, the existing system for distribution of profit envisions a whole number of payments from the enterprises into the budget: deductions from profit, payment for production capital, fixed payments and deposits of free residual profit. This practice of keeping accounts between the enterprises and the state essentially stifles the stimulating role of profit; collectives of enterprises and their managers are not interested in increasing profit for regardless of what it is (as a result of more or less effective activity of the enterprise) all the so-called "free residual" is withdrawn into the budget.

In order to expand the independence of enterprises and increase the motivation of the collectives to increase the effectiveness of production, including the maximum possible release of workers and employees, it seems that instead of numerous payments one should establish a single payment--the income tax.⁷ Its basis could be the actual level of current payments into the budget. After the payment of the income tax all the profit would be left at the disposal of the enterprise (association) and could be used for the development of production and material incentives for workers, managers, engineering and technical personnel and employees.

The rate of the income tax should be established taking into account the differential net income obtained by the enterprise because of favorable climatic conditions and also special technical and economic conditions which do not depend on its activity. Subsequently, as a rule, any revisions of the amounts or percentages of deductions from profit are inadmissible. The collectives of the enterprises must be confident that after they pay the income tax they will be in charge of all the rest of the profit.⁸

The decree of the CPSU Central Committee and the USSR Council of Ministers, "On Additional Measures for Expanding the Rights of Industrial Associations (Enterprises) of Industry in Planning and Economic Activity and Strengthening Their Responsibility for the Results of Their Work" emphasizes that "in order to increase the motivation of production associations (enterprises) to

increase the effectiveness of production, to fulfill their commitments to the state budget promptly and completely, and also meets the responsibilities in this matter, it has been recognized as expedient to expand the application and increase the effectiveness of the normative method of distributing profit so as to leave more profit at the disposal of collectives of production associations (enterprises) that have achieved high final results in their work. Payments are made into the state budget by production associations (enterprises) independently (centrally)."

Understandably, the introduction of the income tax and thus the change in the policy for the distribution of profit will significantly increase the role of the collectives of enterprises who will be able to participate actively in the adoption of decisions concerning the utilization of profit. The enterprises has a right to take out a loan from the Gosbank for a particular amount of interest established by the state and, of course, can use this money both for purposes of developing production and in the direct interests of the labor collectives (construction of residential buildings, sanatoriums, houses of recreation, boarding houses, children's institutions, clubs and so forth). But if the association (enterprise) has not fulfilled its contractual commitments it must make up for the losses from its own funds.

The extensive possibilities of the management and collectives of enterprises to dispose of profit after payment of the income tax would lead, it seems to principal changes in the economic mechanism. There will no longer be a need for numerous compulsory planning indicators. Thus it will be possible to eliminate such a powerful impediment to the development of public production as "planning from the level achieved" which leads to "skillful" concealment of reserves, to the fear of overfulfilling the plan, releasing workers and employees, and so forth.

There is reason to assume that a change in the policy for planning and disposing of profit and overcoming the practice of planning "from what has been achieved" will have a favorable effect on the acceleration of technical progress and on the economic motivation of the collective of the enterprise to regularly increase the effectiveness of production. After all, enterprises that have achieved a reduction of individual expenditures as compared to the socially necessary ones will end up in a better position and will receive real and quite appreciable possibilities of encouraging the collective. There will no longer be a need for forms of external pressure and administrative measures for the introduction of new technical equipment and progressive technology or improvement of the organization of production and labor. Instead of ineffective "power" measures there will be a predictable internal need, a profound interest in updating technical equipment and technology and efficiently utilizing the labor of workers, engineering and technical personnel and employees.

Improvement of Wages

The restructuring of the economic mechanism presupposes a radical improvement in the system of individual and collective material incentives for workers, engineering and technical personnel and employees, and also improvement in the organization of wages.

Serious shortcomings have accumulated in the organization of wages. These include, in particular, equalizing the payment for less skilled and highly skilled workers and engineering and technical personnel (the wages of engineering and technical personnel in industry in 1940 were more than twice as high as the wages of workers, and in 1983 they were only 10 percent higher. Reduced norms in order to maintain the existing level of wages and the retardation of the growth of fulfillment of norms have become widespread again; numerous bonus systems do not fulfill their role in stimulating labor productivity, improving production quality or economizing on past and live labor--the bonuses are frequently given mechanically, without properly accounting for the achievements of the workers; sometimes the growth of labor productivity lags behind the growth of wages.

Refraining from the factors of "planning from what has been achieved" and strengthening the role of profit will make it possible to link material incentives of workers directly to the final results of production.

It would seem that a new stage has appeared in the regulation of wages. It consists primarily in simplifying the system of wages--it must become clear, simple and comprehensible to each worker. The March tendency during the past 2 decades toward reducing the role of piece-rate earnings can be further developed. It would be expedient to change many workers, especially highly skilled ones, over to the salary system. As a rule, salaries could be established at the level of the actual wages (taking into account the wage rate, the degree of fulfillment of norms and the amount of bonuses). It is necessary to revise the salaries for management workers and engineering and technical personnel and employees. Numerous systems of bonuses (there are now more than 70 of them) need to be revised. Bonuses both of workers and of engineering and technical personnel should be made dependent on the final results and on the profit (after the payment of the income tax).

Of course improvement of the organization of wages is an extremely responsible matter. It should be carried out thoughtfully and circumspectly, taking into account branch and regional circumstances and peculiarities. In addition to the salary system, in many jobs and processes it makes sense to retain the piece-rate system of wages.

In this connection serious attention should be given to the results of the experiments of recent years in expanding the rights of enterprises and associations in planning and economic activity of 700 enterprises of five union and republic ministries as well as experiments involving wages of designers and technologists of five associations in Leningrad.

The enterprises report on a minimum number of indicators. As for incentives for labor collectives, they are given not for the percentage of fulfillment of the plan but for the actual increase in production and the effectiveness that has been achieved. The rights of the enterprises have been expanded considerably with respect to the number of employees and their incentives.

Initially 118 design-technological and research subdivisions (about 9,000 people, that is, more than 40 percent of the overall number of engineering and

technical personnel in five associations) participated in the Leningrad experiment. During the course of preparing for the experiment three divisions, eight laboratories and nine bureaus were eliminated. After January 1985 another 18 Leningrad enterprises were included in the experiment.

The wages of designers and technologists of these associations were made dependent on the results of their labor with a reduced number of workers. During the course of certification there is a considerable reduction in the number of engineering and technical personnel, sacrificing mainly those who are less skilled and have less initiative: of the 6,216 workers subject to certification, 381 were discharged and 57 people were not certified.

A constant wage fund based on the limit of the number of workers at the beginning of the experiment (1 January 1983) is established for design and technological organizations and subdivisions engaged in the development of highly effective technical equipment and technology. The directors of production associations have been granted extensive authority with respect to salaries of engineering and technical personnel, staff distribution charts, systems of wages and bonuses for workers for the final results. It has been permitted to establish salaries at the level of engineer-designers of the corresponding categories. The director of the association has been given the right to decide the number of specialists needed in various design and technological organizations and the salary to be established for the workers; it is no longer necessary to maintain the average salaries according to the salary systems or the given ratios among personnel of individual categories.

The material incentives of designers and technologists to perform their work with fewer personnel has become appreciably stronger; increment to their salaries are established for economizing on the wage fund. The amounts of the increments depend on the personnel contribution of the worker to the creation and introduction of progressive technical equipment and technology, to the reduction of labor-, material- and energy-intensiveness and to the improvement of product quality.

At the Leningrad Metal Plant (where more than 1,000 designers and technologists work) the overall savings on the wage fund during the time of the experiment (1983-1984) exceeded 450,000 rubles and 52 percent of this came from releasing workers and reducing the number of vacant positions.

Increments and other incentive measures took up 68 percent of the savings on the wage fund. In 1984 more than half of the participants in the experiment received increments: from 25 to 150 rubles a month. The salaries of 58 engineer-technologists were set at the level of engineer-designers of the corresponding categories.

The experiment played a certain role in improving the activity of the association: in 1984 the volume of production of products increased by 13.2 percent, labor productivity increased by 20.8 percent (more than the planned assignment) and the assignment for reducing production costs of products was also overfulfilled. The association fulfilled the plan for sales and for the products list. The same results were achieved by collectives of other associations where the experiment is being conducted.⁹

By the end of 1984 800 designers and technologists (including vacant positions) were released in the five associations, that is, about 10 percent of the number of these workers at the beginning of the experiment. But during the course of the experiment it became clear that the possibilities of releasing engineering and technical personnel as a result of improving the structure of management, organizing labor and increasing qualifications are far from being fully utilized. It is also necessary to keep in mind that releasing workers has so far amounted mainly to eliminating vacant positions.

The restructuring of the economic mechanism is called upon to radically improve the distribution of labor resources and the utilization of the labor force in the national economy. The collective and the management of the enterprise should have a real motivation to produce high-quality products with fewer personnel.

Under the 12th and subsequent five-year plans a radical improvement of the economic mechanism will create real conditions for planned release of labor force and efficient utilization of labor resources.

FOOTNOTES

1. See VOPROSY EKONOMIKI, No 10, 1983, p 89.
2. "Trudovyye resursy SSSR" [Labor Resources of the USSR], Moscow, "Ekonomika", 1979, p 12.
3. "Sistema upravleniya trdom" [The System of Managing Labor], Moscow, "Ekonomika", 1983, pp 58-59.
4. Ibid., p 67.
5. VOPROSY EKONOMIKI, No 9, 1984, p 34.
6. PRAVDA, 24 April 1985, p 1.
7. The proposal to introduce the income tax was first made by the author in an article in VOPROSY EKONOMIKI, No 12 for 1973.
8. The principles for the distribution and utilization of profit within the association (enterprise) can be developed on the basis of advanced experience.
9. SOTSIALISTICHESKIY TRUD, No 8, 1983, Nos 4, 10 and 12, 1984; EKONOMICHESKAYA GAZETA, No 2, 1985.

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WORK OF MODERN ENGINEER DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 38-44

[Interview with G. A. Yagodin, current USSR minister of higher and secondary specialized education, rector of the Moscow Chemical and Technological Institute imeni D. I. Mendeleyev and corresponding member of the USSR Academy of Sciences, by I. Melenevskiy: "The Prestige and Nature of Engineering Labor"]

[Text] Among the reserves of our science which are not yet being fully utilized is the immense potential of the higher school. How does one increase the contribution of the higher educational institutions to the acceleration of scientific and technical progress? Which problems should be solved first? Our correspondent asked that this be discussed by the rector of the Moscow Chemical-Technical Institute imeni D. I. Mendeleyev, a corresponding member of the USSR Academy of Sciences, G. A. Yagadin, currently USSR minister of higher and secondary specialized education.

[Question] Gennadiy Alekseyevich, when speaking on 14 June 1984 in the CPSU Central Committee at a conference on questions of accelerating scientific and technical progress you touched upon problems of the quality of the training of modern engineers. In what connection was this?

[Answer] The prestige of the Russian engineering schools has always been high. Many principal solutions on a world level have come from our domestic schools. Let us recall only a couple of Russian academicians, for example, S. V. Lebedev, the leader of the development of the first industrial method in the world for obtaining synthetic rubber; I. P. Bardin, who laid the basis for modern ferrous metallurgy; V. N. Ipatyev, he discovered new phenomena in catalytic reactions with high temperatures and pressures. And how can one fail to mention the great work of Soviet engineers during the time of the Great Patriotic War? It was largely because of them that the military industry was created in such a short period of time and began to produce weapons of the highest class.

Great achievements of modern Soviet engineering thought are known in many areas of science and production.

But, unfortunately, frequently the level of qualifications of our engineers still does not correspond to the demands of scientific and technical progress. The body of engineers is losing its former prestige.

[Question] Some specialists link this solely to the fact that the pay for engineers is too low.

[Answer] In my opinion, this is not the only reason. Of course there is a certain distortion in the wages of engineers. During the 1950's the average wages of engineers were 1.8 times higher than the wages of the average worker. In 1985 they were only 1.1 times greater. The comparison with the earnings of the average worker does not reflect the objective situation quite precisely. For the labor of skilled workers is paid for at much higher rates than that of unskilled workers. One must not forget that a worker spends a year to a year and a half in learning and beginning to obtain good money while an engineer spends 5-6 times this amount of time. Obviously, one cannot fail to see the injustice. The result has not been slow in manifesting itself. The competition for technical VUZes has dropped sharply in recent years and many employed engineers are trying to occupy workers' positions.

But still earnings are not the main reason for the devaluation of the engineering profession. But what is the main thing?

Seems to me that it is the change in the nature of engineering labor. The creative basis has essentially been lost. Take a look at how the engineer's working day is arranged. Filling out documents, gathering signatures, responding to complaints, making requests, acquiring some parts, in a word, typical office work, ordinary generation of paperwork. Against this background jobs that are supposed to require specialists with an engineering education are springing up like mushrooms after a rain. We are receiving sad statistics: every second specialist with an engineering diploma is working in a position which does not require higher technical qualifications. It is painful to see how frequently we thoughtlessly waste engineering potential.

[Question] Do you have enterprises in mind?

[Answer] Yes, in many cases the engineering staff is deliberately inflated there. I can even understand what motivates the managers of enterprises in this case. The funds for paying engineers are relatively small and moreover it is simpler to use them at their own discretion than it is other workers, and to send them to vegetable bases, for harvesting hay and for various sponsorship activities. Briefly, if a manager, excuse me, needs to fill up a management hole he cannot find a better candidate than an engineer. This is what we have come to!

[Question] Do you think that we have too many engineers?

[Answer] I would put it more precisely. Now many of them are not being used for their intended purpose. Consequently, the economy simply does not need

this number of engineers. The question of an economic revision of the personnel distribution chart is very crucial. Engineering positions should be held only by those specialists who give 100 percent of their time to creative engineering labor. Here is something to think about. It is necessary to depart more boldly from the ingrained customary concepts.

Just take this problem: a foreman--is this an engineering position? Hardly. It would more than likely be sufficient for a foreman to have the education of a technician. And yet certain skilled workers simply need an engineering diploma. I will give an example from the chemical production with which I am familiar. Today one set of equipment for synthesizing ammonia produces 1,360 tons of product a day (more than the entire branch did in 1940). Can you imagine the threat that faces the industry from interruptions in the work of such a set of equipment? It is serviced not by engineers, but by highly skilled workers who have at their disposal microprocessor equipment, an automated notification system and the most complicated instruments. The responsibility of such a worker for each decision is immense. For the sake of the operation I would make it compulsory to train workers of such subdivisions in VUZes.

[Question] But what is keeping your graduates from finding jobs not in "superfluous" engineering positions but, say, in these same sets of equipment for synthesizing ammonia?

[Answer] Here is a fairly complicated chain of circumstances. The decline of the prestige of the engineering profession has led to a situation where young people are not willing to go to technical VUZes (including ours). What I would call a feminization of engineering labor is now flourishing. Understand me correctly. I am not against the fact that women are becoming engineers. There are many examples in which they are models of heroic labor. But all this is good within reasonable limits. Chemical productions are fairly specific and there are operations, sections and entire shops where there is nothing for women to do. But we are mainly graduating female engineers. And this picture is not typical of our country alone.

[Question] Gennadiy Alekseyevich, is it really not within your power (I have in mind the admissions commission and the rectors) to regulate this process? Are you not the ones who decide how many boys and how many girls to admit?

[Answer] Strange as it may be, under existing conditions we cannot actively affect this process. Large changes have taken place in student life. The image of the romantic, easy student life have not been a reality for a long time. There is a daily heavy load and 60 hours of classes a week is the mandatory student norm. If you barely let up you will not pass, you will fail the seminar courses and you will not pass the quizzes and you will receive a D on your examination. Girls can hold out while boys frequently cannot hold out and leave.

I shall reveal a small personal secret. As the rector I try to dissuade every person who wants to leave. I resort to sly tricks and give them the opportunity to take their tests again. This rarely helps. After all, as a rule, this is not a random failure, but a disagreement with our organization

of training. Assiduity, assiduity and again assiduity--today this is the only possible motto for student classes. Do not think that I am being banal. I personally am severely troubled about the correctness of such a principle.

[Question] But you yourself say that whether you like it or not 60 hours is what the program takes. How can the classes be arranged any other way if the volume of mandatory knowledge is such that the training cannot be fit into a shorter period of time?

[Answer] But who said that a large volume of knowledge is good? Even the great Dmitriy Ivanovich Mendeleev emphasized that teaching whereby the students try to absorb all the knowledge without singling out what is essential and necessary can be compared with a stove that is so filled with fuel that it begins to smoke and not to burn. The excess information which we try to force into the student's head is of no advantage. It is much more useful to give him the opportunity to study independently. The problem of our graduates is that they have heard about everything but they do not know very much and they are able to do even less. They are not prepared for the development and utilization of flexible automated systems, robot equipment or automated designing.

[Question] But is it still possible to eliminate these shortcomings?

[Answer] For modern production it is preferable to have so-called problem study. It should be arranged on independent solving of concrete problems by the students under the supervision of the teacher. It is necessary to learn not at a blackboard with chalk, but on equipment in the shop.

[Question] Is this a slogan or concrete experience?

[Answer] The USSR Ministry of Higher and Specialized Secondary Education has permitted our institute to work under a new training plan. Its essence is that the lectures are cut in half and the volume of the students' independent work is expanded. Two new elements have been introduced into the training--individual assignments and a half-year's production practice.

What does this organization of practice provide? Previously there were two short practice sessions (2 months each) which were more like excursions to the plant. A half-year is not a long time either but still during this time the student has greater opportunities to work in the shop and to carry out special assignments related to improving the work of the enterprise and its reconstruction.

Incidentally it is not only the students, but also the instructors who need a half-year's practice. In the VUZ the following system for training instructors has become customary: excellent student--graduate student--assistant--docent--professor. "Such educators do not ever smell 'production gunpowder.' Six months of practice opens up certain opportunities for increasing the qualifications of the instructors. To be sure, this is not such a simple task. It would be good if the enterprise and the VUZ were linked by joint research work--then they would have mutual interest."

[Question] What problems can be solved by the individual approach in training?

[Answer] In particular this allows earlier disclosure of the creatively gifted students and making extra-class specialists of them who go beyond the modern level of development of technical equipment as well as training specialists "to fit the problem." It is necessary to keep in mind that individualization of training sharply increases the load on the instructor. Now according to the norms of the higher school there are 11 students per instructor. This coefficient must be observed. But what about demandingness? They just try to give a D and suddenly there is a threat of being fired and after this there is the possibility of reducing the staff of educators.... And so a "lukewarm" engineer can leave the VUZ. It is easier that way. It is obviously time to plan the staffs of indicators not in terms of the number of students, but in terms of the number of groups.

[Question] But will this not entail additional expenditures?

[Answer] It is easy to compensate for these by reducing the number of students admitted to engineering VUZes. I repeat that we have too many engineering positions. The number of engineers graduated has been doubling every 10 years. Why do we have such an army of this category of specialists? Let us reduce it while at the same time creating conditions for more effective work. It seems that this is something for the Ministry of Higher and Specialized Secondary Education and the USSR Gosplan to think about.

[Question] We should like to hear your opinion about the condition of the material and technical base of the VUZes.

[Answer] This is one of the sore spots. So far the higher school frequently reminds one of a homeless orphan. Representatives of VUZes go with their hands extended from one ministry to another asking for equipment for training and scientific processes. It is no secret that many VUZes lag behind the leading enterprises by a good 2 decades with respect to the material and technical level.

The higher school is considered the future of industry. But can one really be so careless about the future? It would seem that the branch ministries could render real assistance to the VUZes.

[Question] Gennadiy Alekseyevich, perhaps they do not allot funds assuming that the expenditures on the higher school will not be recouped?

[Answer] In Japan--a country where they can handle their money--allocations for the organization of the higher school are considered the most profitable. In my opinion this is not without reason. The level and skills of the VUZ graduate is the level of industry. And skills, in turn, depend essentially on the material and technical base with which the students learn and the degree to which they participate in scientific work.

[Question] Is the participation of students in research work so important?

[Answer] This develops in the future engineers a scientific approach to their work. This is why it is necessary to expand the volume of scientific research work. For instance, the practice of student construction detachments is an important addition to higher education. The state approach brings the training of future engineers into the economy. I am quoting D. I. Mendeleyev again: "It is always necessary to have an economic faculty as well..., in which they would generalize economic knowledge which is very frequently inadequate in our narrow specialists." Giving a definition of technology Dmitriy Ivanovich emphasized its economic nature: "For example, it is a matter of chemistry to study how iron is obtained from ore..., but it is a matter of technology to study the most advantageous way of doing this, to select from the possibilities the most acceptable--in terms of advantageousness--for the given conditions of time and place in order to make the product as inexpensive as possible while still having the desired properties and forms."¹ This has been said very precisely. I think that these words are just as timely today.

FOOTNOTES

1. Mendeleyev, D. I., "Soch." [Works], Vol 21, Leningrad, ONTI Khimteoret, 1952, p 333.

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PROGRESS OF NEW KRASNOYARSK ENTERPRISES TRACED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 45-69

[Article by Tatyana Boldyreva and Valeriy Lavrov: "Gulliver's Lilliputian Steps"]

[Text] On the map of new construction sites Krasnoyarsk Kray is among the leaders. Extremely large industrial complexes are being created here. Their prompt startup and assimilation of capacities determine the development of entire branches of the national economy, serve as a kind of reference point and make it possible to take fuller advantage of the possibilities of new technical equipment and technology. The Krasnoyarsk Heavy Machine-Building Plant and the Sayanogorsk Aluminum Plant can be considered to be such enterprises.

Unfortunately, in the stage of construction they have not been able to avoid the fate of many Krasnoyarsk construction sites which were discussed by Comrade M. S. Gorbachev at the June (1985) conference on questions of scientific and technical progress.... Work should be conducted here, as everywhere, with concern for a rapid return on expenditures.... There are now 5,000 facilities to be started up in the kray. As a result of the dispersion of forces the construction is proceeding slowly and the losses of resources are great.

The first sections of the Krasnoyarsk Heavy Machine-Building Plant and the Sayanogorsk Aluminum Plant have already been put into operation. But without waiting until this happened, collectives of operators were formed at both enterprises and they are already producing their first products.

Our magazine intends to follow the first steps of these enterprises. The main goal of this article is to discuss the problems encountered by collectives during this

difficult period of their life and how these problems are resolved. We hope that this analysis will be useful for many new enterprises.

In Krasnoyarsk there is a region called Strelka. The concert hall rises up here--as the Krasnoyarsk residents say, the largest one in Russia, the 30-story building of the KATEK Scientific Research Institute rises up here. On the right and on the left 16-story residential buildings lead the way to the Strelka. But only when flying, from up above, can one see that this actually is a "strelka" [needle] on whose point is the future building of the KATEK Scientific Research Institute. And it points to the Yenisey route. There, 20 kilometers from the city, even from an aircraft one can see the size of this large construction project. Its area is 4 million square meters. Here one can see many features of future industrial construction and domestic machine building. This future is carried on the not very broad shoulders of the collective of the Krastyazhmash Association. The already existing plant for producing heavy excavators and the metallurgical plant which is not even under a roof yet are joined together here. The first piles were sunk in 1978 and 6 years later, in 1984, the startup of the first section was planned.

What Is in Your Name?

In 1985 they manufactured here the 20th mine excavator with a 12.5-cubic-meter bucket and the first walking excavator with a 40-cubic-meter bucket. The emphasis on excavators is known everywhere, but the head designer, Dmitriy Vladimirovich Bulavin, told us:

"We are not correctly named: the division of the head designer for excavator construction. There are 115 people on the distribution chart and 87 of them are on hand while it takes 200 people just to handle the problems of unification of the future items of the enterprise. In general the designers will go into the scientific research institute where several thousand people will be working. I think that we will deal with more than just excavators. A more likely title would be the division of the head designer for mining machine building...."

Here is what the designers have to say: "So far we are receiving documentation from the Izhorsk Plant, the Novo-Kramatorsk Machine-Building Plant, Zhdanovtyazhmash, Uralmash.... They all have different names but are designing the same machine, and they order parts and components in different ways.... We will bring everything under one system in a way that is suitable for machine processing...."--we recalled the settlement of Solnechnyy.

It grows up in semicircles of nine-story residential buildings on the hills. The builders of the new plant and the plant workers live here. Nearby they have built a highway that is "international" by local standards. A Volga at a speed of more than 100 kilometers passes the future on and off ramps on two and three levels. On a wall of one of the buildings in Solnechnyy hung a poster which explained why these changes had taken place in the northwestern frontiers of the city.

The association will be a giant for producing heavy excavators and mining equipment in the USSR. It will produce mine and walking excavators as well as rotary complexes. On the whole it will produce 5 times as much of this kind of equipment as is now produced in the country.

"The shops are equipped with the most highly productive equipment. There will be a principally new production technology. In essence this is the future of machine building. The immense buildings have much light and air. A person finds it pleasant to be here throughout an entire shift."

Such is the advertising for guests of Solnechnyy. In some ways it is not far from reality.

The number of workers in the association is 4,226, and engineering and technical personnel--2,931 (as of 1 September 1985). One of the major items of Krastyazhmash will be mine excavators with a bucket capacity of up to 30 cubic meters. In a year it will have to produce 60 of these machines, which no single plant is capable of today. Another item is the walking excavator with a 40-cubic-meter bucket and a span of 85 meters--the pride of Uralmash. In 1985 in the Tulunskiy coal mine in Irkutsk Oblast Uralmash workers, with the participation of Krasnoyar workers, assembled their fourth walking crane since the beginning of production. Eight of these machines a year is the planned capacity for the new enterprise. The next machine, which was discussed in the advertisement, is a rotary complex which no plant in the country can produce completely. This machine is practically an independent enterprise which processes more than 5,000 cubic meters of earth, coal and ore per hour. Now it is assembled with parts from everywhere.

Today nobody can predict what else Krastyazhmash will do. In September 1985, for example, it was clear that the association could produce 100,000 kitchen machines worth a total of 10 million rubles.

Now, having looked at the new enterprise from the height of the future, let us return to land. It is still a long way to the planned volumes of production at Krastyazhmash. Its estimated capacity ranges from 2-3 billion rubles. More than one-third of this sum has already been spent. The scale of the construction site is as impressive as are the funds that have been spent. The first blue and brown shop buildings, looking like spaceship hangars, are fantastic. Their average size is 500 by 200 meters. Translated into football fields, 30 football teams could play at the same time under the roof of any shop. Without spectators, of course.

In the constellation of the country's many construction projects, the best known and the largest, this remains a star of the first magnitude. And not because hundreds of millions of rubles have been thrown in here and not because the latest technology of industrial construction is tested here or because convoys of trucks loaded with equipment of the highest technical level keep coming and coming. For the first time in the postwar period heavy industry has been able to establish a plant of such a scale starting from nothing, from zero. The USSR Ministry of Heavy Machine Building joins together several hundreds of large enterprises, but all of them were

constructed along ago. They have been reconstructed, they have expanded, they have grown and become younger.

"But still they are old," said the head engineer of Krastyazhmash, Ivgeniy Nikolayevich Rumyantsev, who came here from Uralmash. "We shall grow to be a head above everybody else!"

In terms of volumes--undoubtedly! But when?

The startup of the first section was intended for the first half of 1984. Now the deadlines have been pushed back until 1988. And when will the plant reach its full capacity? Nobody will risk making a prediction about this yet.

The approved first section of Krastyazhmash will be able to produce up to 140,000 tons of mechanical items. But what will be the level of readiness of the objects of the first section by the middle of 1985? Three-fourths of the facility for the assembly of mechanics shops with a capacity of 125,000 tons have been put into operation. The facility for welding machine-building structures which is intended for producing 60,000 tons of items has introduced about half of its capacities. In the facility for auxiliary shops one-third of an area of almost 150,000 square meters has been assimilated. They have not been able to find a way to put the first buildings of the metallurgical plant under a roof. And on the whole only one-fifth of the production capacities of the first section have been put into operation.

Thus not one of the buildings of the first section was completed in 1985 even though the deputy minister of the Ministry of Heavy Construction, P. P. Selskiy, in an interview with KRASNOYARSKIY RABOCHIY on 6 February 1985 said in particular that four of the buildings had been constructed. But in our understanding "constructed" means suitable for operating the capacities that are included in the plan.

"Personally I cannot predict when the document for receiving the first section for operation will be signed. With the current situation at the construction site even the new deadline might not be met," says General Director of the Association, Yuriy Ivanovich Yushkov.

This plant, the "youngster" of heavy machine building, is already raising difficult problems for managers of the branch. At one of the meetings of its staff the conversation happened to come around to the number of excavators the Krastyazhmash workers would be able to manage in 1985: 8 or 10. "Give us casting, and we will give you twice as many!"--this was unexpected news to the manager's ears and it was as though for the first time they had seen the strapping figure of the head engineer who was 32 years old. "But even for these 8-10 excavators it will not be easy to find the metal! So far we only have enough for eight machines"--the decision followed.

"On the whole we are finding a common language with the administrations and divisions of the ministry and our problems are being resolved. But having such an enterprise under construction is still an exceptional thing for the USSR Ministry of Heavy Machine Building," said Yu. I. Yushkov.

It was not until 1985 that, through his active efforts, the future giant was released from the guardianship of one of the VPO's and transferred to the direct jurisdiction of the ministry. It was as though even the USSR Ministry of Heavy Machine Building began to understand that on the 20th kilometers of the Yenisey route there would be a new kind of reading of time and the level of achievements of domestic heavy machine building.

The Future Standard--Nonstandard Items

The grand entrance to Krastyazhmash is clogged with buses in the mornings. Having gotten out of one of them we turned to the left, to the first building, at the very beginning of the enterprise's territory. Here in one of the bays in 1922 they assembled the first two mine excavators with a bucket volume of 12.5 cubic meters.

In this building, which is called the KNO Building for Nonstandard Equipment (there are the most people--more than 700 workers in 1985. Even on an excursion one cannot go through it in a half day even though only half of the capacities have been introduced. Actually this is a plant which now produces a fairly varied mixture of items--from components and parts of excavators to weights for sportsmen.

The chief of the production of nonstandard equipment showed us everything and discussed it. Today this production is headed by Yu. M. Boldin):

"In this bay we manufacture coke and chemical equipment and here--equipment for agriculture.... It is a pity that the workers have left; we also have a section for artistic metal casting...and these are steps for escalators in the subways; they used to be assembled but we are mastering single castings which are safer and more reliable. And here we make fittings for metallurgical production--dust catchers...."

Usually these shops are located somewhere in the back yards of the enterprise or else they are scattered through as separate sections among the basic shops. Here everything is gathered together under one roof at the very beginning of the plant. When it reaches full capacity (30,000 tons) about 2,000 people will work here and this will be the first such plant in the country.

"And for the entire branch," added the deputy head engineer of the association, Gennadiy Lazarevich Matushanskiy, who is in charge of preparation of production." It will be so well equipped that scientific research organizations will be envious. There is, for example, a testing installation for the experimental shops. The institute imeni Ye. O. Paton wanted it. Doctors of sciences are leaving their visiting cards and want to work on our equipment. We have questioned all plants of the branch: "What can they not manufacture for themselves on their own equipment?" And we received a thick packet of applications for various machine tools and other sets of equipment which no one will take on and which cannot be purchased anywhere. Usually this is equipment used as the junctures of technological processes. The specialists think that at these junctures labor productivity drops by 30-40 percent.

But such an unprecedented "experimental plant" is being utilized in a trivial way today: it is loaded with products from the basic shops. And so are one cannot see a force that is capable of turning this "plant within a plant" to the work for which it was created--the production of unique technical equipment which is not produced anywhere else. We should also accelerate the creation of our scientific research institute within Krastyazhmash. There is no doubt at all that within the branch and outside of it there is sufficient scientific stockpile awaiting practical realization: in the association one can hear about new designs for technical equipment that is being developed at the Moscow Mining Institute and in the Novosibirsk Institute of Mining Affairs of the Siberian Branch of the USSR Academy of Sciences....

The situation in machine building is unusual: the capacities for this kind of production were put into operation before the capacities for series production were. And it is excellent that the managers of the association wish to take scientific and technical progress "by the horns" that in the dossiers of the specialists in the association there are dozens of addresses of scientific subdivisions throughout the country where one can find ideas and that already working in the association are three candidates of sciences in three basic spheres--management, product design and production. But a sad fact also remains: Krastyazhmash has had to come to an indisputable truth at its own risk and with its own mental capabilities--without the proper scientific preparation of production it is impossible either to manage it or to operate the technical equipment that is received or to produce products of a high technical level.

Now the management, design-technological and production forces of the association are sufficient only for a certain modernization of traditional products that have long been assimilated at other enterprises.

"Our main machine, the EKG mine excavator, was designed in 1964," says the deputy head engineer of the association, G. L. Matushanskiy. "And it has been fairly well assimilated at the Izhorvsk Plant. If we take the Izhorvsk variant one on one it turns out that we are constructing a plant with new technology for old products. Still we have improved the machine: we have found out its weakest points and are eliminating them.

"We are taking measures to improve the quality of our products," said the chief of the patronage installation shop, Yuriy Aleksandrovich Afanasyev. "Only 20 excavators have left the gates of the enterprise. They are better than the previous models of these machines that are operating in the mines. Their reliability has increased, for example. It has become easier to assemble them and the patronage assembly workers are aware of this as they are aware of the fact that the excavator is more precise and easier to control than the Izhorvsk excavator.

Thinking about these statements of managers and leading specialists of the association we do not find an answer to the main question: what is the level of output at the new enterprise and when will this level increase? Experimental models, for example, of a mine excavator with a bucket volume of 15 cubic meters and a rotary excavator with a productivity of 5,250 cubic meters an hour, as before, are being created at the old plant. The need for

machines to be used in the Far North is not decreasing and machines with a frost resistance down to 60 degrees below zero are what we are talking about. The new mines in Siberia and Kazakhstan need more powerful and lighter equipment.

Today Is Too Early, Tomorrow Too Late

"I am the third director and my service and division chiefs change frequently also," says the general director of the association, Yu. I. Yushkov. "And there is no guarantee that the manager who leaves will be replaced by a better one, one with a higher managerial rank. And if third-class managers are entered in the world championship it is clear what position they will take. The problem of starting up the first section of this enterprise, in my opinion, is more difficult than organizing championships, as is the problem of assimilating capacities that have already been introduced. At best they are loaded by one-third. But I cannot think of a more difficult problem than the personnel problem."

And we agree with him. An enterprise that is barely established changes its managers frequently. Or they change it. To no small degree the personnel problem is the problem of permanent managers of the enterprise, their status, their qualifications, their rights and responsibilities. Taking into account the experience of similar construction sites of the Ministry of the Automotive Industry and the Ministry of Power and Electrification (with a comparable volume of capital investments), it would be better if the director of Krastyazhmash had the rank of a deputy minister during this difficult startup. Then it would be much easier for him to get things done in his own ministry as well as in the Krasnoyarsk management agencies.

Strange things are taking place in Yu. I. Yushkov's office in the meantime: the managers of all the local management agencies each day "attack" him with their measures and demand that the general director participate in them. These are measures that are sometimes fairly remote from the interests and the concerns of this enterprise. Frequently they take into account only narrow individual interests. They try to load the production capacities through this office in order to eliminate bottlenecks in other Krasnoyarsk enterprises. And frequently they load not the machine tools that are standing idle but those which are already overloaded.

"They come personally," says Yu. I. Yushkov. "To help? No, mainly to inspect, to go over our mistakes with the magnifying glass. To teach. We are not against training, but what kind? Perhaps the ministry and the local management agencies would send the most experienced specialists so my specialists could follow them around for a month or two or three and gain some knowledge! The director must be given the opportunity to do his work. There are sufficient means in our management system in order to allow this. Please, here is another phone call from the procurator's office.... And even if you try, you cannot do all this work: now I am fighting with the Gorispolkom over housing. Our own office is trying to divide things up in a way so that we have less. but how else can I attract skilled workers other than by offering them apartments quickly? As soon as I defend the interests of the collective, which has learned to get along even without support, I immediately become for

certain higher and laterally placed managers an incorrect...uncontrollable... intractable...poor director and in general a bad person: it is difficult not only for me, but for all the managers of the plant. But still I do not understand people who leave the enterprise. The production organizer, beginning with the foreman, has plenty of interesting work here. And the engineer gets a chance to think: nowhere else can one find so much excellent equipment. And the economist must roll up his sleeves: he will find nothing but losses, fines and so forth, as if we had been doing nothing for the past 100 years!..."

If one were to take the group of problems that were difficult for the enterprise in 1985 (organizational-administrative, economic, construction, technical-technological, supply), it would seem to us also that the most crucial is the personnel problem. It can be resolved by the enterprise itself, practically without assistance from territorial and union management agencies. The association's personnel division, sensing that the Krasnoyarsk source is drying up, is organizing information-advertising kiosks at the railroad station, in the bus terminal and in the airports. They have received permission to hold meetings in the units of the Transbaykal Military District. Demands placed on managers of the association have become stricter: "Let the day begin not with the production plan, but with personnel, the first hour of their work has to do with personnel." In 1985 measures from working with personnel were fairly extensive, amounting to more than 100. In particular, stipends in the amount of 500 rubles were offered to discharge military personnel.

But quantitatively and qualitatively the problem is still just as difficult. The enterprise needs skilled workers and engineering and technical personnel but it would be desirable for them not to be overloaded with work experience at other enterprises. In the technical aspect Krastyazhmash has higher and higher branch indicators: mechanization of processes for mechanical treatment of metal--96 percent, assembly--63 percent, auxiliary work--41 percent, while at the branch level these figures are 90, 60 and 30 percent, respectively. The proportion of progressive machine tools according to the plan should be 53 percent, and at Uralmash it is 37.7 percent, and not every machine tool operator from there is capable of working here. At Krastyazhmash there will be 21 GPS's--flexible automated production systems (more than there are now in the entire branch!). In all of the sections here there will be complete introduction of ASUTP's. Computer equipment is being introduced everywhere. A wonderful picture which we saw with our own eyes: a girl is sitting in front of a television screen and using an electronic "pencil" on a "sheet of metal" and one cut or another is being programmed on the screen. A belt with points is transferred from here to one of two gas-cutting automated machines and the cutters cut the parts from rolled metal without any human participation. Krastyazhmash does not need "marking kings" on whom the precision of the manufacture of the items and the quantity of the wastes depend today in many branches. It needs specially trained people who know electronics. And they must be trained in a completely different way, which is shown, for example, by the only lathe capable of processing a part 16 meters long and 1.2 meters in diameter, which is standing idle. It is the most precise machine tool on which it is possible to carry out a multitude of operations, right down to polishing. In foreign countries such machine tools

are used 24 hours a day and competing firms even cooperate in using them. And here the electronic equipment is being pilfered bit by bit while the machine tool waits for a foundation and installers. This kind of handling of equipment is simply barbarous. But this case and cases like it are caused by the lack of understanding on the part of the workers that the majority of machine tools of their enterprise have no electronic equipment. They are just a heap of metal. A lack of understanding combined with the inability to handle such equipment. It seemed to us that nobody is seriously thinking about the training and education of personnel for such technical equipment, about the transfer of young workers who have already mastered this equipment, for example, from other enterprises and not only enterprises of this ministry. Nobody has thought about this or about any of the sad circumstances that ensue from this which are so plentiful in the reality of the newest enterprise.

The construction project is still just getting started and is still far from releasing the first section for operation. It would be too early to gather specialists here. But tomorrow will it not be too late? It is already too late for certain of the machine tools.

In 1985 in the association there were many forms and means of training workers and young engineering and technical personnel and wiser managers. "Everything is as it is at the other enterprises." But when will this system produce a return?

"The traditional forms of training are good if we had a conveyor, but unit production, and exceptionally complicated production at that, requires different personnel decisions"--this is the opinion of the general director, Yu. I. Yushkov.

"We have technological transportation on an air cushion, radio control of gantry cranes, a mass of equipment for scientific and research purposes...but take the problem of assembling the shops or putting a roof over our heads. Even the loaders and cleaning personnel must be technically literate. Hence the crucial personnel problem"--says the deputy head engineer, G. L. Matushanskiy.

"A person who has worked here for 3 or 4 years is priceless. If he returns to his old enterprise--and there have been examples of this--he is an altogether different specialist," says the general director, L. L. Chernov.

"The personnel workers of the ministry did not think about us. But we have prepared advertising posters and we shall place them at all of the crossroads," says the deputy chief of the association's personnel division, S. V. Romanenko.

After these meetings one is left with the impression that the territorial management agencies are bothered only by the large number of personnel at Krastyazhmash: it is necessary to feed them, house them and so forth. In the branch agencies they have not yet turned to trying to find a new solution to the personnel problem for the new enterprises. "Who could come to us?" representatives of Krastyazhmash asked one of the managers of the branch. "Whoever you can talk into it is yours..."

And that is all the assistance they got.

How the Construction Project Became Uncontrollable

But why are the Krastyazhmash capacities being introduced with such delay? After all this was one of the most dynamic construction projects in Krasnoyarsk Kray and in the beginning labor productivity here was twice the average for Glavkrasnoyarskstroy. That is almost a miracle. Taking into account the way the work was getting under way, in 1981 a task was set to produce excavators in 1982. This task, as we can see, is being carried out by the Krastyazhmash collective under the conditions of an unfinished first section and poor scientific-technical and personnel support. So what happened in the construction of one of the 13 large industrial complexes of unionwide significance in Krasnoyarsk Kray?

"The first section could have been constructed in 6 months while the normative is 110 months. But even this amount of time is long enough since one is looking at world experience in industrial construction," says the former chief of Glavkrasnoyarskstroy, now the director of the Krasnoyarsk NIIPromstroyproyekt, Vladimir Petrovich Abovskiy. "In the first stage they used, in the first place, the program-target approach, in the second place, there was a high level of industrialization of construction, and in the third place, they combined the stages of planning and construction. At the construction site there were practically no bricks, boards or "wet" processes.

Other veterans of the construction project also recall the comprehensive target program which was signed by three ministers. They recall 18 variants of planning, staffing, the technology of operation and the system of the organizational structure for this construction. Much was being done for the first time. The electronic computer was operating at full force, weaving together local models into a consolidated and Procrustean imitation model of the organization of construction. Assembly construction conveyors were created. Here they used large technological blocks with an area of from 324 to 1,000 square meters and weighing more than 200 tons. The specialization of the construction work was brought up to 75 percent of the overall volume. There was a sharp reduction of labor-intensiveness and the cost of construction.

"The VAZ experience was good. There everything was put under the jurisdiction of the board of directors of the enterprise," said V. P. Abovskiy. "But here a weak board of directors was created. Its functions were made the responsibility of the directors of the old Sibtyazhmash enterprise which has plenty of its own problems. The new director of Sibtyazhmash refused to take on these functions. But even the independent board of directors was created for small volumes of construction. And we construction workers were not on top of things either. The calculation was simple: 100 million rubles as the annual volume of construction work divided up into units to handle 10,000 rubles (the average per main board)--it turns out that the construction site needed 10,000 workers. It began to introduce more and more new trusts. Each came with its own goals, rules, policies, and the construction site became uncontrollable.

The former deputy general director of Krastyazhmash for construction, L. L. Chernov, when he heard the question: "What happened at the best construction project in the kray?" took out a sheet of paper and began to write down the construction organizations of four ministries (the Ministry of Heavy Construction, the Ministry of Power and Electrification, the Ministry of Transport Construction and the Ministry of Communications of the USSR).

"It turned out that there were 13 contractors," he counted. "General contractors!..."

"But that doesn't happen," we objected. "Usually there is one general planner and one general contractor."

"But that is exactly what happened. Along with the subcontractors there were more than 50 organizations and a couple of more ministries," said Chernov. "They all had their own technical and economic indicators, their own interests and their own structure. Incidentally, an inflexible structure which does not react quickly to the changing operating conditions is not directed toward the startup of capacities."

"But why couldn't the client, that is to say the directors of the enterprise gather all participants in construction together and join them into one? Apparently the client was weak?" we asked.

"And not only weak. He also underestimated the scale of the plant. Why does it take 30 people to direct such an enterprise? The planning documentation was shipped in in trucks. The problem was to unload them and distribute it to the general contractors. Not a single person who sat down with this documentation thought or evaluated: what had the planners done? So many mistakes were made. Neither the client nor the planner nor the builders were able to recognize them promptly. The general planner was Uralgiprotyazhmash which had encountered such a large volume of work for the first time. Also in our ministry was Soyuztyazhproyekt, where they planned, for example, Atom mash. They would have been able to handle the general planning of Krastyazhmash and would have selected subplanners more correctly. But what they did was select planning organizations that were the least busy, that is, the weakest. Our technology, for example, is temporary and there is an abyss of questions regarding it. Why? The Novokramatorsk NIIP T mash did not provide the corresponding staff and did not assign personal responsibility for the technical level of this enterprise to the director of this institute.

There was a sea of new technical equipment that was taken away from other enterprises. It was placed on fields No 1, No 2...in a row, and not on the foundation which was planned. They dragged this wonderful technical equipment from the platforms and threw it right down on the ground since there was no unloading equipment and there were no warehouses. And yet a beautiful picture had been planned: the cars would come up to the shop and gantry cranes would immediately place the equipment on the foundation! But the four contracting ministries were not able to find a common language and they did not fulfill the plan for construction and installation work. Millions of rubles that were allotted for the creation of the construction base went who knows where.

Perhaps they know in the Ministry of Heavy Construction. Up to this point an enterprise does not have reliable telephone communications...so many absurdities! They have constructed a boiler for two plants which has the same capacity as an ordinary TETs. It is not a matter of what it is called. But a boiler as distinct from a TETs has half the staff, the salaries are also less, there is no equipment for turning over the cars (without them--the coal is unloaded by hand), and it was necessary to get through all this!

The monologues of V. P. Abotskiy and L. L. Chernov, in spite of all their differences, are similar in that the start of the construction site was good and then--everything went to pieces.... As the general director of Krastyazhmash, Yu. I. Yushkov noted, "if one were to figure out what happened at the construction site it would be necessary to write an entire detective novel, the more so since investigatory agencies also participated." And putting aside emotion, it remains an indisputable fact that there was a desire to economize and initially not to spend any money at all on the staff of directors whose role was to be filled by the directors of Sibtyazhmash while they still had to be concerned about their own production. The savings which subsequently turned into large disasters were achieved in the planning and research stage as well. One can see false savings also in the supply of the construction site with everything necessary from existing bases of the construction industry. It seems that it is not difficult now to figure out that even the initial deadlines absolutely did not correspond to the construction capacities. Today all this is obvious. But at that time, apparently, they were bewitched by the rough figures from the comprehensive target program calculated on a computer using the most modern scientific methods, particularly mathematical models. But any program needs a manager and control over its implementation. In the history of the construction site there is neither a manager of the program nor a control group there, and without these such a program is only paper.

One can consider all the events at the construction site to be an experiment for which the conditions for success were not maintained.

Now, 7 years after the beginning of the discussions about the organizational and technical experiment for high-speed construction of the largest enterprise, one could look more soberly and not without general advantage at what it has produced besides memories of strategic and tactical mistakes.

From our standpoint the "fallout" from the experiment is in evidence. Under one roof or four immense buildings in which it would be possible to place four medium-sized plants. To construct them the construction industry assimilated and the builders used materials of world standards: steel structures with increased and high durability, economical profiles of rolled metal, lightweight wall partition structures with galvanized steel flooring, and effective reinforced prefabricated reinforced concrete elements. The use of the last items, for example, when assembling the building for nonstandard equipment reduced the labor expenditures of the construction workers by 17,000 man-days and reduced the overall volume of the building by almost 100,000 cubic meters. The number of installation elements was reduced to one-half to one-third the number found in buildings of the same type made of traditional reinforced concrete elements.

The external and internal appearance of the buildings clearly proves the high technical level of the Krasnoyarsk Plant for Experimental Lightweight Structures and the great possibilities of the metallurgical industry. It would seem that any modern industrial firm would be proud of such buildings.

Nor can we underestimate the experience of those who raised them up. To be sure, in Krasnoyarsk they recall that the organizational force closest to the new construction site was the Krasnoyarskalyuminiystroy Trust: from the nearby hills one could see the pipes of the Krasnoyarsk Aluminum Plant which was constructed by this trust. The trust was eliminated because the volumes of work decreased and the personnel, as they say, "were spread thin" and they began to create from the group up the new Ekskavatortyazhstroy Trust. The new collective of builders who had barely gotten on their feet advanced to a leading position and mastered new construction technology, new materials and new labor organizations. And the fact that this actually was something principally new in construction is shown by many facts: at first the construction project was a year and a half ahead of schedule and on the whole the labor productivity at it set a record. And this for a newly created construction collective which had no experience!

And so quite a bit is left to us from this excellent time. There are also the comprehensive target program, the models for the organization of planning and construction and the "gains" on the computer. All this is experience which can quite possibly be repeated. This is not the last construction project of this type.

All Our Life Is an Experiment

"From what point can one consider the enterprise to be operational?" we asked this question of almost all of the managers of the Krastyazhmash Association.

"We have begun mechanical processing of parts and components for the excavators, we have organized assembly in one way or another, and we have a plan for the output of machines. But there is no metallurgical production or production of blank billets, and we have relied on cooperation...." reflects General Director Yu. I. Yushkov. "So what should we do, sit and wait until the builders release the rest of the facilities of the first section? About 300 people who received apartments from the plant have already left. And why? We do not even have elementary order. Everything can be ascribed to the conditions of an enterprise under construction. So things go no further: by the time of the release of the first section for operation we should have in the key positions ace machine builders and super workers because it will be necessary to solve super problems. And who will give us such workers? Nobody! It is necessary to work with the people we have. To teach them and teach them! And they must understand that they will never get a better chance in life. This is an unplowed field, virgin land, regardless of what kind of work you take up. But at the new plant we are keeping the traditional organization which is suitable for old enterprises. We are receiving blueprints from other plants and losing time by cutting others' belongings to our size. The ideal is to have the plant orchestrated as a complete unit. But the reality is that the enterprise can be considered operational and it

must be considered operational from the day the foundation is laid for the first machine tool!"

"Today in the shops there are unique machine tools, frequently the only ones of their kind in the country," says the head technologist Gennadiy Mikhaylovich Chigasov. "But in the same shop there is temporary technology which distorts the capacities. Many of the necessary shops are not in existence and the instrument production did not go into operation until 1985. The machine tools have no instruments, fittings or adapters. A great deal is unclear, beginning with the list of items in the shops that are in operation. We have already changed the technological documentation three times for such an old machine as the EKG-12.5 excavator, and this means 7,000 technological processes. Perhaps it would be less expensive to wait until the first section starts up?"

"Immense technical capabilities have been incorporated and already exist. One must not withdraw equipment from circulation, especially unique equipment. True, we have not been lucky. We have fallen into a chain of experiments--it was an experimental construction project and now the enterprise, which actually does not exist yet, and even the first section has not been put into operation, has fallen into the large-scale economic experiment and its conditions are fairly severe even for well-arranged productions. We are expected to perform like adults while we are still children.... If one thinks about it, parallel construction and the output of products is also an experiment. How do we get by? There was a large amount of 'incompleteness' and uncontrollability of capital investments. Perhaps the mathematicians at Krasnoyarsk University will be able to help us: they are suggesting an imitation model for managing the enterprise," reflects the deputy head engineer of the association, G. L. Matushanskiy.

"We must live more simply," said the chief of the patronage installation shop, Yu. A. Afanasyev. "The difficulties of this period are sometimes artificially reinforced and it is necessary to take a realistic and personal look--what have you done, for example, so that the equipment which does not exist in one other heavy machine-building plant will produce a return. Or, with respect to your service, even today the enterprise should create a strong service policy and a broad network of technical service points. What is happening with our excavators if we look at it from the standpoint of the state? Powerful machines are being delivered to the mines and the client does not have the forces to assemble them rapidly, and our excavator alone can produce 2 million cubic meters of coal a year. The gross cost has skyrocketed by 300 rubles and the losses will amount to millions if this is not changed quickly. Today we can send our own workers to the mines in order to rectify the situation somewhat because we are asking that the plant's products be sent not too far away. But tomorrow they will be going to Krivoyrog or Central Asia. They cannot send a machine there with spare parts. To look and see what they are doing in Kemerovougol--they are distributing the same types of machines among various mining faces, and just try to offer technical servicing for them! The firm's brand name can be seen at the mines where the plant's products were and already are. And it is important to prepare the people psychologically for completely new organization of their work. For example, it is thought serious organization of work with the consumers is found at

Uralsmash, but I personally do not like their universalism. I think that they have narrower specialization in various types of machines...."

If one looks at the true picture of what happened at Krastyazhmash in 1985 one must say that the price of the formation of a powerful collective of machine builders who "will solve problems of creating technical equipment that goes into the 21st century" (from advertising within the enterprise) is fairly high. It includes tens of millions of rubles of all kinds of "overhead" expenditures because of what is called inefficiency but is more precisely the low economic, technical and cultural level of the workers. For example, the restoration of machine tools and sets of equipment received by the association costs (mainly because of electronic equipment which has been lost or is unsuitable) from 30 to 45 million rubles (various services of the association give different figures but the lowest is given by the bookkeepers.

The cost of the enterprise includes the destinies of thousands of people who have come and are coming here. For them the years spent here can be the best in their lives, and they can also be the worst. Local wits suggest making a woman with a baby carriage the emblem of the village of Solnechnyy where, according to various estimates, from 100,000 to 250,000 people are to live. And this is not at all a joke. The machine builders are creating not only the enterprise, but also families, they are establishing themselves here permanently, they are raising individual gardens and orchards, and they are making fundamental capital improvements on the land. The youngest people do not consider themselves to be temporary residents. This is especially noticeable when one visits their homes. In the shops of their enterprise this sense of being permanently established is manifested to a much lesser degree....

"Far from everyone considers the plant his own and far from everyone has understood and taken responsibility of what is expected of them," this is how the general director Yu. I. Yushkov explains our misgivings. "As the director, this surprises me. For in production that is running well man runs too like on a track. Someone has blazed the trail and all the rest follow along it. But here is nothing but a space--you create your own rules and traditions. Some people are simply frightened by this space, the freedom to make decisions and the lack of limitation on initiative. Our goal is to make one walking excavator in a month and a half. Today this causes some people to laugh. But will they laugh tomorrow? We are very much in need of--let me put it bluntly--fanatics. A Master with a capital M. We do not need "football players"--specialists who are able to pass on their questions...although, incidentally, we will have a first-class stadium and--I believe--first-class football players. Everything will come! Has it been a long time since the first building without light and running water was inhabited in Solnechnyy. And here we have thought up the names of streets because we got lost among the buildings without them! We are showing films in the school hall, but we will also have our own palace of culture. And we have already begun to return the money from state centralized sources that was spent on the plant. And the return from each worker is increasing. The quietude is coming to an end and we have held the first congress of shock workers who sang songs about their own plants for the first time in 1985!"

The machine dove into a big hole in the parade entrance of the plant. Sidewalks were laid between the shops at the insistence of the division for the development of the enterprise's capacities. So far they have not had the means for building roads. The plant territory remains in back and it is not surrounded by a fence yet. A convoy of buses is moving toward Solnechnyy, outdistancing the plant passenger diesel train.

On our right was Solnechnyy, which at one time was not a model demonstration settlement distinct from the construction project. And we asked one another: so what is being created on the 20th kilometer of the Yenisey route at such a high price: the pride of our machine building and industrial construction? Or a testing ground which demonstrates the impotence of these branches? After all, the startup of the first section itself was put off for an entire five-year plan and the startup of the enterprise's full capacity is still somewhere in the dim future. Imagine spending so much time and money in order to produce a minuscule part of the planned production program each year! We recalled the "Analysis of the Results of the Krastyazhmash PO Under the Conditions of the Economic Experiment" which was drawn up by the Krasnoyarsk Division of the Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences.

"The first capacities were introduced in 1981...planned-loss.... No control figures were received for the five-year plan.... The time schedule for dispatching products was violated because of the irregular arrival of the cars for whose idle time the PO paid 118,600 rubles in fines during 1984.... The fine for late delivery of products was 443,700 rubles.... There is a shortage of 4,507 tons of metal for the 1985 program (mainly thick sheet steel).... At one of the Moscow plants since 1982 representatives of the PO have been 'scaring up' engines for the EKG-12.5.... Bearings arrive from Kuybyshev only after the personal intervention of the PO at GPZ-9.... It is necessary to get a hold of funds for more active developments for improving the design of the excavator itself: not 0.5-0.7 million rubles, but 2-2.5 million--in order to include new technical solutions.... Above-normative residuals of material values amounted to "the fulfillment of the plan for objects for production purposes was 33.4 percent and for housing and social-cultural facilities--89 percent. There are serious difficulties in the delivery of batching components and parts and there are constant disproportions between the startup and assimilation of production sites and the planned output of products."

Fairly contradictory feelings remain after one becomes familiar with this undoubted "star" of machine building. One cannot but experience excitement about the scale of the project, but it is impossible to avoid the thought that it could have been done quite, quite differently.

Numerous meetings with managers and specialists of the Krastyazhmash Association and our reflections and observations make it possible to single out the most crucial issues whose resolution at various levels would have a positive effect on the destiny of the new enterprise.

1. It is necessary not only to introduce (although at new time periods) objects that are primarily necessary for the plant, but also to introduce a complex of shops and other installations so that it will be possible to

produce products without interference. And in this respect the decisive words and deeds should come from workers of the Sverdlovsk Uralgiprotyazhmash Institute and the subdivisions of the USSR Ministry of Heavy Construction that are located on the construction site.

2. The young production collective of machine builders should be more clearly oriented toward the development and output of principally new technical equipment. Now in the existing shops and in their plans one cannot see that the USSR Ministry of Heavy Machine Building has a technical administration, its own scientific research institutes and good connections with academia and VUZ science.

3. Any technical equipment is dead without people. But the influx of qualified personnel to the new enterprise, it seemed to us, was too random. People "from outside" can hardly master this production and therefore the personnel service of the USSR Ministry of Heavy Machine Building should probably organize a search for people at "old" enterprises.

4. The construction of housing and social-cultural facilities should undoubtedly be accelerated and this is quite within the realm of possibility for the three DSK's that are under the jurisdiction of Glavkrasnoyarskstroy. Today in the shops one can see children who are being fed from baby bottles here.

5. People who work here must have additional incentive "privileges" during this period, beginning with a higher wage coefficient than the one now used in the rayon.

In conclusion we think it appropriate to recall the words of Comrade M. S. Gorbachev at a conference on questions of accelerating scientific and technical progress: "What are important are thoughtfulness, consistency and the need for rapid achievement of the national economic effect.... Since we have earmarked certain tasks, our implementation of them should be complete, comprehensive, rapid and energetic."

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EXPERIMENT IN COST ACCOUNTING CONDUCTED

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[Article by Ye. A. Skoblikov, candidate of economic sciences, head economist of the Penzavodprom Production Association: "In Spite of Instructions We Are Conducting an Experiment in Cost Accounting"]

[Text] The decrees of the party and government of recent years have earmarked measures for improving planning, evaluation of the results of activity and incentives, and they have earmarked a program for the development and strengthening of cost accounting [khozraschet].

The work for introducing cost accounting foundations into the practice of management is being done at many enterprises of the country. EKO has written about this repeatedly. Let us recall, for example, the selection entitled "Cost Accounting at KamAZ (No 7, 1979). As a rule attempts to introduce cost account come from below, from the management and economists of industrial enterprises.

The lack of the proper methodological developments leads to a situation where various approaches to the introduction of cost accounting are used at various enterprises and even the very concept itself is frequently understood in different ways.

Today we are publishing articles about the experience in introducing cost accounting fundamentals into the practice of the work of the Penzavodprom Association and also about the approach to the introduction of cost accounting and enterprises of the Ministry of Instrument Making, Automation Equipment and Control Systems. Possibly the ideas expressed by the authors, for example, the introduction of the actual net output as the basic indicator, will seem questionable to the readers. In this case we are prepared to turn the floor over to the opponents. The file of the editorial staff also has other

materials on cost accounting at enterprises, for example, from the experience of ZIL. So this subject will be continued.

In 1981 we decided to change the shops over to cost accounting and began preparing for this. The shops in the basic production were changed over to cost accounting beginning in January 1983, and in 1984 several of the auxiliary shops were. Here we had to decide where to begin: "from above"--with cost accounting for the association as a whole or "from below"--with cost accounting for the shops and sections of production. Taking into account the innovation of the approach that was adopted, it was decided to try its elements in the shops first.

Basic Methodological Provisions

Plan or fact? Traditionally cost accounting from the production association to the brigade is arranged on the basis of evaluating the fulfillment of the plan according to cost accounting indicators. Here it is thought that the greater the number of indicators established by the plan, the greater the number of systems that are developed to provide incentive for economizing on various kinds of resources, the more perfect the cost accounting is. But long-term practice has revealed a stable tendency: the more rigid and all-encompassing the interconnected economic indicators that are established and monitored, the lower the actual results. The struggle for the fulfillment of the plan is mixed with its opposite: influence on the level of planning indicators through deliberately concealing reserves, holding back the growth of production and increasing expenditures for the sake of creating a "base" for the plan for subsequent periods. Here the economic workers have developed such a rich arsenal of devices that neither administrative pressure nor incentives for adopting counterplans can break this tendency. As Ye. T. Gaydar notes,¹ in the overwhelming majority of cases the management of the enterprises will not reveal large reserves for increasing production effectiveness in the plan in order to obtain an increase in the material incentive fund of 10-20 percent at the risk of failing to fulfill the plan.

It is known that a change in one economic indicator entails various changes in others. Thus improvement of the quality of the products that are produced causes additional expenditures of labor and material resources, but the two indicators are planned separately and are even established by different functional agencies of the management staff. Therefore the production workers are faced with a dilemma: to provide quality and not fulfill the indicator for reduction of production costs or to lower the production cost but not fulfill the assignment for quality. And when there are too many cost-accounting indicators the administration ceases to see this interconnection, the stimuli for effective management are dulled and cost accounting with its "all-embracing" grasp of planning is left to itself.

The figures for the fulfillment of the plan always show us not the final result of production but only how precise and balanced the plan was and how it took into account the concrete conditions of production. Correspondingly, one should provide incentive not for the fulfillment of the plan with respect to an ever-increasing number of cost-accounting indicators, but the actual final

result that was achieved or its gross as compared to the preceding period. But then could the final result be expressed with one indicator? In our opinion it could. It is the actual obtained net output (FChP).

The FChP is not only the final result of production, but also an integral indicator of cost-accounting activity. Changes in the FChP show the total sum and the balance of the economy or the redistribution among the various kinds of expenditures and they show whether a bonus has been earned or not. Thus if a shop economizes on fuel by increasing the number of ton-kilometers (and this leads to an increase in transportation expenditures) the FChP will decrease and, consequently, there will be no bonus for the transportation workers for economizing on fuel and lubricants, but it will be necessary to figure out the accounts and, perhaps, impose a penalty for inefficient organization of shipments. In exactly the same way providing incentives for directly economizing on other material resources that are in short supply will not always produce a savings for the enterprise as a whole. Actually the net output, as distinct from other indicators of the volume of production, is only the particular result of the activity of the collective. In the gross, commodity and sold output the proportion of material expenditures is considerable, that is, there are the results of others' labor. The normative net output (NChP) characterizes the results of live labor which should be achieved but one does not know whether they were achieved or not. As distinct from these indicators the actual net output does not contain expenditures of others' labor; this is not the normative but the actually achieved amount of net output. This is what is subject to distribution for wages, deductions into the budget and the economic incentive funds, and other payments from profit.

The fact that we have based cost accounting on the actual net output and not on numerous cost-accounting indicators has made it necessary to coordinate other elements of cost accounting with net output as well. In shop cost accounting of our enterprise new elements have appeared: gross income, conventional shop prices, base output and base average wages, and the scale of dependency of the average wages on the growth of labor productivity. Material incentive and responsibility are directly related to the FChP. Let us consider these elements in sequence.

Gross income. Under the real conditions of management, especially at the shop level, the FChP cannot operate in its pure form since it does not take into account the influence of the activity of the participants in production on one another. Therefore from the value of the FChP that is obtained it is necessary to subtract losses from defective work, fines imposed on the shop by the administration for failure to fulfill the plan for volume and products list and complaints from other shops, and also rebates for savings if the cost-accounting commission of the association considers these to be inefficient. At the same time the FChP is increased by the amount of complaints against other shops and compensations for certain kinds of expenditures, for example, thermal energy during the winter. The sum obtained as a result of these calculations will be the gross income of the shop.

Let us take a look at how the gross income is determined using a concrete example taken from the monthly report of the shop (rubles):

	<u>Planned</u>	<u>Actual</u>
1. Normative net output	17,960	18,180
2. Commodity output	230,140	236,296
3. Change in incomplete production	--	-2,033
4. Gross output	230,140	234,263
5. Material expenditures	212,180	200,851
6. Net output (Line 4-Line 5)	17,960	33,412
7. Defective work (taking into account delays)	--	2,615
8. Complaints, fines	--	--
9. Compensations (+), rebates (-)	--	-12,437
10. Gross shop income	17,960	18,360

As a result of increasing the volume of production the FChP increased by 322 rubles ($17,960/230,140 \times 234,263 - 17,960$) and as a result of economizing on material expenditures--by 15,130 rubles ($212,180/230,140 \times 234,263 - 200,851$). The total is 33,412 rubles ($17,960 + 322 + 15,130$). This amount was reduced as a result of defective work by 2,615 rubles and by a decision of the cost-accounting commission, 12,437 rubles that were not used for protection of labor and the art of production and repair of equipment were taken away from the shop because they were considered to be inefficient savings.

We should like to draw special attention to the last circumstance. It cannot be allowed for equipment, buildings and structures to fall into a state of disrepair or to lose their attractive appearance because of neglect simply for immediate advantage. It is even more inadmissible to save at the expense of working conditions and the help of workers even though a certain reduction of these expenditures per unit of useful effect is permissible. But the usefulness of this kind of savings must be proved to the association's cost-accounting commission.

Conventional shop prices. The price is the basis, the foundation of cost accounting. The amount of net output and, consequently, the sum of the FChP depend directly on the precision of the prices of products produced by the shops. Therefore before beginning a calculation of prices for each kind of item and semimanufactured product produced by the shop, the existing norms for the expenditures of material, energy and wages were carefully examined, the variable expenditures for the maintenance and operation of equipment and shop expenditures were verified several times, and the planned volumes of production for the year and their distribution for the various months were made more precise. The net output in conventional shop prices was precise observance of the established norms provided for obtaining the full volume of wages and bonuses for workers and engineering and technical personnel, including from the material incentive fund. And with respect to this quality it represents the shop normative net output. In order to increase the amount of the bonus it is necessary to achieve a reduction of expenditures as compared to the normatives, and the difference between the FChP which is increased because of this and the NChP will show the economic effect that has been achieved.

A peculiarity of the conventional shop prices used in the association is that the calculation of the price serves as the only basis for planning the production cost in terms of the various elements and items of expenditures. This provides a reliable basis for control over each kind of expenditure and the analysis of the factors in economizing or overexpending them. The commodity output, the volume of the NChP and the production cost in the cross-section of calculation items of expenditures are calculated according to a special form.

The planned wage fund with a breakdown for the individual categories of workers is also determined from a calculation of the planned production cost which provides a complete coordination of all expenditures. Therefore the planned wage fund is always less than the planned NChP by a previously known amount: deductions for social insurance and deductions into the material incentive fund. At the same time a comparison of the planned wage fund with the actual level that is reached serves as a means of control over the correctness of the development of conventional shop prices. If one thus discovers considerable deviations that do not depend on the work of the collective the conventional shop prices are adjusted or compensations (rebates) are given.

The base average wage for each shop is determined by dividing the base wage fund by the number of workers according to the distribution chart. And the base wage fund, as distinct from the planned wage fund, is the sum of wages and the additional payments and bonuses established by law, including from the material incentive fund, which all workers would receive if all planning assignments were fulfilled and conditions were met for bonuses according to the previously existing system. Here the wages of piece-rate workers are determined in the same way as for time-rate workers, that is, on the basis of the wage rate and not the piece rates. This is done in order to stimulate a revision of piece rates and remove from them the function of regulating the wages. For if the time norm is actually technically substantiated, it can be fulfilled only by an average of 100 percent.

The base output in the system of cost accounting using the indicator of net output is determined simply: since the net output in conventional shop prices is more than the wages and bonuses by the amount of deductions into social insurance, the base output (PT_b) should be more than the average wages ($Av. ZP_b$) by the percentage of these deductions: $PT_b = Av. ZP_b \times 100 + 4.4/100 = Av. ZP_b \times 1.044$, where 4.4--percentage of deductions for social insurance for the RSFSR Ministry of Water Management.

Material incentives. The gross income obtained by the shop is the only source of wages and deductions for social insurance and bonuses both under the wage fund and from the material incentive fund. But since the association as a whole is on formal cost-accounting and the wages are paid regardless of the amount of income received, the main cost-accounting load falls on the shop's material incentive fund. Therefore it is formed as the residual amount after the payment of the wages from the gross income taking into account the previously established ratio between the growth of the average wages and labor productivity.

A peculiarity of the system for determining the material incentive fund that has been adopted is the fact that the maximum permissible growth of the average wages, depending on the growth of labor productivity, is given beforehand according to a special scale. We had no scientific recommendations at all when developing it. We were guided by only one consideration: the higher the growth of labor productivity the greater the amount by which the wages should lag behind it. If all reserves have been exhausted the growth in output is possible only as a result of increasing the intensiveness of labor and therefore it cannot be greater. Consequently, the growth of wages compensates for the higher labor expenditures and the difference should be insignificant. A sharp increase in labor productivity shows either that the normatives are not difficult or that the effect was achieved with the participation of the services of the entire association and therefore cannot remain at the disposal of the shop. The growth of labor productivity and wages is determined not in terms of the corresponding period of the past year as has previously been the case, but according to their normative values: the base average wages and the base production of gross income.

The methods for determining the shop's material incentive fund can be seen from the example of its calculation for the electrical pipe welding shop for May 1983.

1. Gross income, rubles	18,360
2. Number of workers	68
3. Production of gross income, rubles per person	270.0
4. Base output (PT _b), rubles	192.1
5. Growth of output (Line 3:Line 4), percentage	140.5
6. Base average earnings, rubles	184.0
7. Coefficient adjustment of the growth of wages (K _{zp})	0.85
8. Maximum amount of average wages, rubles (Line 6 x [(Line 5/100 - 1) x K _{zp} + 1] = 184.0 x [(0.405 x 0.85 + 1)])	247.3
9. The maximum wage fund (Line 8 x Line 2), rubles	16,816
10. Paid wages, rubles	16,210
11. Material incentive fund, rubles (Line 9 - Line 10)	606
12. Residual (reserve) material incentive fund for preceding period, rubles	423
13. Sum of material fund for distribution (Line 11 + Line 12), rubles	1,029

Material responsibility is realized through reimbursing the shop or section for damaged caused to it and charging the sum of this damage to the results of the economic activity of the shop or division that caused it. Here damage is understood to mean not only direct losses, spoilage of materials or overexpenditure of energy, but also lost advantage, for example, if the shop has stood idle at the fault of another subdivision and has failed to obtain the volume of net output established by the plan during the time it was idle.

A peculiarity of the system of cost-accounting claims adopted in the association is the fact that the claims for the reimbursement of damages can be made not only by the shop against other shops and divisions, but also by the association's administration against shops if they do not fulfill the

assignments set for them. It is known that when evaluating activity according to percentages of fulfillment of the plan the shop can achieve high indicators while at the same time causing harm to the enterprise as a whole. When, for example, the items or semimanufactured products are manufactured in excess of the established assignment the association as a whole cannot count on deliveries from the entire list of products. In these cases adjustments and restrictions are usually made in the provisions concerning bonuses. We have taken another path. For if the association has failed to receive some of the products, on the one hand, it has been unable to sell a certain sum of net output and, on the other, it has sustained losses of supply materials for the manufacture of unnecessary products and their storage in the warehouse. So the claim for the sum of these losses should be made by the production division of the association. The legal expert and the bookkeeping office of the association fill out a complaint against the shops for fines, penalties and forfeitures paid to other enterprises, and the supply division--for the overexpenditure of supply materials as compared to the norm, and so forth. Additionally, when the plan is not fulfilled for the most important items on the products list, a fine is imposed on the shop in the amount of 500 rubles, and when there is an unjustified refusal to recognize the complaint the cost-accounting commission of the association can impose another fine in the amount of 1 percent of the rejected sum of the claim.

The claim reduces the income of the shop by the amount of damage it caused and the fine that is deducted. Correspondingly, the wage fund is reduced by the same sum. Since the association does not have the right to change the wage conditions, a reduction of the wage fund leads to a reduction of the shop's material incentive fund. The material incentive fund can even have a negative value. As a result, the shop does not receive bonuses until it makes reimbursement for the overexpenditure of the wage fund.

We try to reduce the bonuses of specific workers who are guilty of doing damage that has been caused by the amount of that damage. But if it exceeds the sum which can be reimbursed with the bonuses of specific guilty parties, the bonuses of other workers are also reduced. In our opinion this is fair since the violations of production and technological discipline, losses, and sometimes even an irresponsible attitude toward equipment and its material take place for everyone to see. Shop workers are coproprietors of the production capital entrusted to them. And as comasters they must be responsible for its efficient utilization.

The First Results

What has cost accounting provided for us? With a planned production cost of 9,552,000 rubles we obtained a savings of 673,000 rubles. In all shops without exception the growth of labor productivity considerably exceeded the planned growth and there was a savings on the wage fund in an amount of 40,600 rubles. But a comparison with the plan does not always provide precise figures since when drawing up the plan it is possible to have deviations in one direction or another as a result of mistakes or deliberately included reserves. Let us take a look at how the results of the work of the shops changed in 1983 as compared to the same period of 1982. The production cost of the compared products decreased by 488,900 rubles, although one of the

shops changed over to the output of new, more labor-intensive and material-intensive products. The lowest growth of labor productivity was in the concrete-mixing shop--8.3 percent, and the highest--in the enamel shop (29.3 percent) where the expenditures of wages per ruble of net output decreased by 21.7 kopecks.

But the most important result of the changeover of the shops to cost-accounting was the change in the attitude toward economizing and the change in the psychology of the shop workers. Many people began to think more seriously about economic indicators, to check on the level of material expenditures and wages, and to consider any organizational and technical decision from the standpoint of the economic results it would produce. There were greater demands and adherence to principles in relations with associated shops and divisions of the plant administration, and not immediately but gradually it became a norm to make cost-accounting claims against one another for damages.

The following circumstance should be especially emphasized. The shops are given bonuses not for the percentages of fulfillment or overfulfillment even on cost-accounting indicators, but depending on the actual final result that was achieved--the gross income. But this has not reduced the role of the plan, which we are constantly being warned against. On the contrary: there have been a sharp increase in the demands for substantiation of all planning calculations without exception. Thus when developing the shop prices we were given increased volumes of services of the auxiliary shops, as a result of which the main shops began to achieve greater savings on expenditures. We immediately made adjustments to the planning calculation which previously we simply would not have done. Another example. The basis for calculating the base average wages for the mold preparation shop was the distribution chart with an increased need for basic workers, which led to a reduction of this distribution chart. There was a corresponding decrease in the coefficient of adjustment of the growth of the average wages K_{zp} , and according to the calculation the material incentive fund also decreased. Here the desire to reduce the plan and create reserves ended up in real losses of the material incentive fund.

In spite of the fairly long period during which the shop engineering and technical personnel were "getting used to" cost accounting without changing over to it, one cannot say that the changeover to cost accounting took place smoothly. There were repeated situations in which under previous conditions a shop could count on a bonus if it had fulfilled the plan now was either deprived of it or the amount was quite insignificant. The shop chiefs found it difficult to become accustomed to the fact that it was not enough to fulfill the plan--in order to obtain a bonus it was also necessary to create a savings, on which the amount of the bonus depends directly. On the other hand the shops were given the opportunity to obtain bonuses even when they failed to fulfill individual indicators if they were able to achieve an overall savings on expenditures. The process of assimilating the system of cost accounting claims was also difficult until the shop managers understood that by not making these claims they were punishing the entire collective.

Up to this point, in spite of all of our efforts and even administrative pressure, our association's bookkeeping office is standing on the sidelines of

cost accounting. It is possible to obtain a report on the results of the shops' activity without changing anything in the organization of accounting on the 8th-10th of each month. We receive them on the 15th if we are lucky, and then for each case of deviations from planned expenditures, overexpenditure and complaints we must figure out and make decisions about where they should be applied--either the shop should pay or it should provide a compensation or a rebate. Before drawing up the balance the bookkeeping office itself processes the initial documents and only after this can the shop economists use the bookkeeping data to compile the shop production cost. This means not only double labor expenditures but also an essential time lag for summing up the results of the work for the month. It is of no small importance that this narrows the possibilities for doing a developed analysis for as soon as the report is drawn up it is necessary to make planning calculations for the next month.

The situation described above is typical. Everywhere where cost accounting is being introduced or approved the problem of accounting arises. Quite unfortunately, its solution depends on the good will of the head bookkeeper. There is only one reason for this--instructions for accounting...simply do not contain any indications regarding the determination of the shop production cost and the bookkeeping office is not responsible for its precision. The introduction of intraplant cost accounting depends on the initiative of individual people, and each enterprise must take its own path because the existing provisions regarding accounting are in no way linked to shop cost accounting. The slow dissemination of brigade cost accounting is also explained by the fact that it has not been "assimilated" by accounting. Therefore it is necessary to devote the most serious attention to improving accounting. It must be regarded as an indispensable element of intraproduction cost accounting. Cost accounting for the shop, section and brigade, in our opinion, should become mandatory for any enterprise--this is the only way the issue can be stated now. As a transitional measure we would suggest putting the bookkeeping office under the jurisdiction of the head economist and having the head economist sign all forms of bookkeeping and statistical reports. Then the management of the enterprise's economy would be unified and integrated.

Toward Complete Cost Accounting

But the changeover of the shops to cost accounting has not taken place in the precise sense of this concept. In keeping with the provisions concerning cost accounting the bonuses for the shops should be made directly dependent on the gross income they create, taking into account adjustments for the coefficient by which the average wages are corrected. In fact the amount of the bonuses for the shops are determined depending on the availability of money in the association's material incentive fund. Thus during a year all shops formed the material incentive fund in an amount of 136,900 rubles, but it was possible to give them bonuses in an amount of only 14,800 rubles or one-ninth of what was intended. Because of the lack of money bonuses from the material incentive fund were given only to engineering and technical personnel and, consequently, the workers were only indirectly included in cost-accounting relations.

Naturally the impossibility of obtaining the money that has been earned and the removal of most of the workers from the sphere of cost accounting were serious obstacles on its path and, one must assume, that the incentives for increasing production effectiveness remained undisclosed. To be sure, we found a solution: we began to divide up that share of the material incentive fund which was to go to the main shops in proportion to the material incentive fund created by each of them. This made it possible to smooth out somewhat if not to eliminate the obstacle that had arisen.

Hence it follows that there can be no effective cost-accounting of the shop without cost accounting of the enterprise as a whole. The same thing pertains to brigades. The brigade contract is spreading slowly because the workers are not interested in the cost accounting of the shop and the shop engineering and technical personnel are not interested in the cost accounting of the brigades. Engineering and technical personnel of cost accounting shops receive at least some bonuses for reducing production costs, but the workers and brigades do not. Moreover the contracting brigades, which receive from the engineering services production which is generally fairly well prepared, "do not share" their bonuses from the wage fund either with the shop personnel or with their foremen.

The principles for paying wages and bonuses should be the same in all units of production. What is the point in having the bonuses for workers from the wage fund be included in the report in the material incentive fund if they cannot be used for awarding bonuses for other categories of workers who make the same contribution to the fulfillment of production assignments! It is necessary to eliminate this artificial division of funds for wages and staffs for workers, engineering and technical personnel and employees. And this can be achieved if the enterprise as a whole is changed over to cost accounting.

Cost accounting should encompass all units of production without exception. Before changing the shops over to cost accounting our association's economic service in conjunction with the Institute of Economics of the USSR Academy of Sciences prepared proposals concerning the changeover of the association as a whole to cost accounting as an experiment. Then it was suggested that cost accounting be introduced proceeding from the association as a whole to the shops, from the shops to the brigades, and from the brigades to individual jobs. But our suggestions are still in the stage of consideration and coordination. We decided not to wait for permission to conduct the experiment and used the shops as models to test the individual elements of cost accounting on the basis of the indicator of the actual net output.

What does cost accounting mean in the association as a whole? Its pivotal point should be the collective material motivation (and material responsibility) for the final results of production. The greater the volume of product output and the lesser the expenditures of materials and energy, the better fixed capital is utilized and the higher the labor productivity--the higher the wages as well (but with a previously given coefficient of difference). If defective products have been produced, harm has been caused to nature or an agreement has not been fulfilled--the losses are taken from the bonus funds. And if these are not sufficient--from the wage fund, the economic incentive funds and other funds from which the money can be taken.

Expansion, reconstruction and the introduction of new technical equipment are done only with the association's own money or with bank credit. How many personnel to maintain and what kind of management staff to have--these are the business of the association itself. There is no point in limiting the number of personnel from above if the wages of each will be higher when fewer people perform the same volume of work. Relations with the higher organization on a firm normative basis: it formulates the production plan in physical indicators and gives the material resources according to norms, and the enterprise guarantees a solid percentage of deductions from the gross income for maintenance and for the centralized funds. Payments into the budget are also made according to stable normatives of deductions from the gross income. Here all of the external payments and deductions are made primarily independently of the financial condition of the association, which serves as a powerful means for reducing the volume of funds which are in circulation and placing stricter demands on associates who violate their commitment.

Intraproduction cost accounting is acquiring new force under the conditions of cost accounting in the association as a whole. The difference between the funds of the shops and those of the association will be eliminated. That part of the association's net output which goes for wages and material incentives must be distributed among the shops and subdivisions in proportion to the labor they have contributed and its effectiveness. Thus a close connection will be established between the earnings of each worker and the overall results of the work of the enterprise or association on the one hand and the expenditures and effectiveness of their own labor on the other.

Under the conditions of complete cost accounting it will not be necessary to conduct large-scale measures for revising wage rates and salaries in order to find a solution to such crucial problems as maintaining the initial ratio between the wages of workers and engineering and technical personnel and restoring to the time norm its true purpose--being a measure of the expenditure of working time and a basis for planning labor, and not a means of regulating wages. With the establishment of collective material interest the earnings of each worker are not calculated according to salaries and wage rates, but are distributed in keeping with them and with coefficients which determine the degree of their participation in labor and the quality of the products they produce. The contract principle for the distribution of earnings becomes general--it embraces all workers and the entire wage fund.

All of the aforementioned solutions have been developed in the association right to the point of concrete working documents. But...our association is small in size and it is also under republic jurisdiction so that, as became clear during the course of coordination, it cannot take the initiative to conduct economic experiments. It turns out that the Institute of Economics of the USSR Academy of Sciences does not have that right either although it has been criticized for the weak link between science and production. In our opinion, this situation impedes forward movement. Every enterprise, regardless of its size and jurisdiction and the more so an academic institute should have the right to experiment (of course, under the control of the corresponding departments and management agencies). This is the only way it is possible to create a scientific and methodological stockpile for improving the economic mechanism in subsequent five-year plans. Moreover, there is no

better way to approach this goal than through small and medium-sized enterprises where, as in models, it is easier to work out principal solutions than it is when conducting large-scale economic experiments.

FOOTNOTES

1. Gaydar, Ye. T., "Problems of Improving the System for Forming the Wage Fund," IZVESTIYA AN SSSR. SERIYA EKONOMICHESKAYA, No 2, 1983, p 36.

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COST ACCOUNTING IN INSTRUMENT BUILDING MINISTRY DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 85-95

[Article by F. I. Solodovnikov, candidate of economic sciences, and B. Ya. Zheleznyak, candidate of economic sciences (Novosibirsk): "Intraproduction Cost Accounting in the Instrument-Building Ministry"]

[Text] In 1970 the Ministry of Instrument Making, Automation Equipment and Control Systems was one of the first industrial ministries to be changed over as an experiment to cost-accounting [khozraschet] methods of activity and new principles of interrelations with the state budget. This required a strengthening of the role of economic methods at all levels of management. A comprehensive program was developed which envisioned research and experimental testing of the measures that have been developed initially at base enterprises and subsequently their introduction throughout the entire branch. All branch scientific research institutes participated in this work, including the State Scientific Research Institute of Automated Systems for Planning and Management of the USSR Ministry of Instrument Making, Automation Equipment and Control Systems.

Status in the Improvement of Intraproduction Cost Accounting

Workers of industrial enterprises are not always able to answer the question of whether or not intraproduction cost accounting has been introduced at their enterprise. For in order to answer it correctly it is necessary to know the degree to which the existing system of cost accounting corresponds to the normative requirements.

In the development of intraproduction cost accounting, in our opinion, it is necessary to distinguish three stages:

the introduction and adjustment in base facilities of intraproduction cost accounting which corresponds to the demands of the existing economic mechanism;

planning and introduction of a comprehensive intraproduction cost-accounting mechanism for management at industrial enterprises and in production and scientific-production associations;

further development and improvement of intraproduction cost accounting in keeping with the development and improvement of the economic mechanism.

The first stage is the most labor-intensive and the longest. It requires a considerable amount of time and expenditures not so much on the development of the mechanism of intraproduction cost accounting itself as on the restructuring of norm setting, planning, accounting, cost accounting interrelations, control, evaluation and material and moral incentives.

On the basis of the methodological materials developed in the branch¹ an investigation was conducted of 178 enterprises and production and scientific-production associations. At each of these, according to the results of the investigation, comprehensive plans of measures were developed for improving the system of cost accounting. A number of standard methodological recommendations were also developed and introduced. They were intended for workers of all structural subdivisions of production and scientific-production associations--enterprises, scientific research institutes, design bureaus, shops of basic and auxiliary productions, sections, brigades, divisions and services.

The development of methodological support made it possible to carry out a large-scale changeover of the enterprises, production and scientific-production associations of the Ministry of Instrument Making, Automation Equipment and Control Systems to the second stage--the planning and introduction of a comprehensive intraproduction cost-accounting mechanism for management. Cost accounting became one of the factors contributing to the profitable, self-supporting work of the branch under the 9th, 10th and 11th five-year plans.

Under the 10th Five-Year Plan we updated more than 50 percent of the products, the list of which included 12,000 types. Labor productivity increased by 52.3 percent. Profit from industrial activity increased an average of 2.7-fold as compared to the preceding five-year period. The increase in industrial output as the result of increased labor productivity amounted to 82.6 percent. The production cost of the products that were produced decreased by 10.9 percent. The plan for the 11th Five-Year Plan for reducing production costs was fulfilled in 4 years. As of 1 January 1985 the standard methodological recommendations were fully utilized at more than half of the enterprises of the branch and partially--at 49 percent of the enterprises. Interesting experience was accumulated in the Lvov Biofizpribor Production Association, the Vinitsa Terminal, the Kishinov Volna, the Severodonetsk Impuls NPO and others. Of the brigades created at enterprises of the branch 23.8 percent were changed over to cost-accounting methods of operation.

The Heart of Cost Accounting--Coordination of Interests

The comprehensive intraproduction cost-accounting mechanism of management helps to coordinate national economic, collective and personal goals and interests of enterprises of the Ministry of Instrument Making, Automation Equipment and Control Systems. Its basic scheme is presented in the figure.

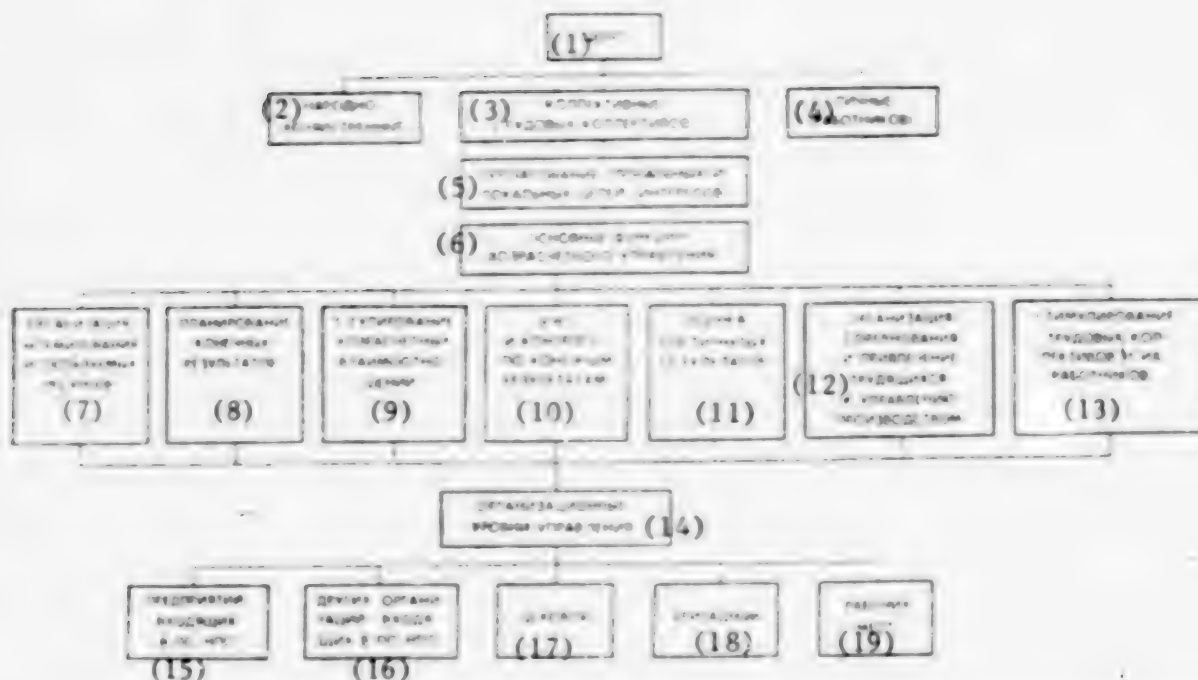


Figure. Diagram of comprehensive intraproduction cost-accounting management mechanism.

Key:

1. Goals
2. National economic
3. Collective (of labor collectives)
4. Personal (of workers)
5. Coordination of global and local goals and interests
6. Basic functions of cost-accounting management
7. Organization of norm setting for resources used
8. Planning of final results
9. Regulation of cost-accounting interrelations
10. Accounting and control of final results
11. Evaluation of results achieved
12. Organization of competition and enlistment of workers in production management
13. Incentives for labor collectives and their workers
14. Organizational levels of management
15. Enterprises included in PO, NPO
16. Other organizations included in PO, NPO
17. Shop
18. Brigade
19. Work position

The system of cost-accounting relations should always be drawing intraproduction cost accounting to a higher degree which corresponds to the normative level. This goal can be reached only by adjusting the comprehensive cost-accounting mechanism of management. Its effective functioning requires:

to grant internal subdivisions operational and economic independence;

to create a system of progressive technical-economic norms and normatives as a basis for intraproduction planning, accounting and objective evaluation of cost-accounting activity of the subdivisions;

to select a reduced number of approved planning indicators of cost-accounting activity, replacing some of them with long-term economic normatives;

to provide for stability and balance of planning assignments;

to take into account the degree of difficulty of the plans when drawing up the assignments and when determining the labor contribution of the production collectives and workers;

to provide for a system of accounting and control of all expenditures and the results of the work of the subdivision;

to establish material and moral responsibility for material damage;

to create a system of material and moral incentives for workers in internal subdivisions which takes into account the labor contribution of each to the final results.

How are these requirements met?

The basis of the organization and successful functioning of the cost accounting mechanism for management are the norms and normatives. Consequently, improvement of intraproduction cost accounting can efficiently begin with developing these (refining them), introducing them and maintaining them at the socially necessary level. It is these progressive technical and economic norms and normatives that are at the basis of other economic levers (wages, production cost, normative net output and so forth) and are used as initial amounts for planning, accounting, control, analysis and evaluation of the most important aspects of the association's (enterprise's) production and economic activity as well as that of its structural subdivisions.

The system of established planning indicators and economic normatives is the pivotal point of the cost-accounting mechanism of management. Depending on conditions and production functions it is recommended that cost-accounting subdivisions establish the following planning indicators and economic normatives.

For enterprises included in the production association and shops of basic production:

production of products in physical terms within the given time periods;

the quality of products, work and services (coefficient or percentage);

the growth of labor productivity (in percentages);

the effectiveness of the utilization of resources (in appropriate units);

the normative of expenditures per adopted unit of measurement of the volume of production of products (kopecks);

the normative of wages per adopted unit of measurement of the volume of production of products (kopecks);

the normative of internal circulating capital or individual elements of it (thousands of rubles).

For shops of auxiliary production:

the list of products, jobs and services in the appropriate units, including the most important one;

the quality of products, work or services (coefficient or percentage);

the growth of labor productivity (in percentages);

the effectiveness of the utilization of resources (in appropriate units);

the wage fund (thousands of rubles);

the maximum level of expenditures per ruble's worth of products, work and services (kopecks);

the normative of individual elements of internal circulating capital (thousands of rubles).

For sections and brigades:

the products list for the output of products within the given time periods;

product quality (release of products with first application);

growth of labor productivity (or reduction of labor-intensiveness of products, jobs and services);

the wage fund or the normative wage per adopted unit of measurement of production volume;

the limit on material expenditures (per adopted unit of production volume in physical or value terms);

other indicators of the effectiveness of the utilization of production resources.

For divisions and services:

the directive assignment established for the association (enterprise) by the higher organization, the responsibility for whose fulfillment is borne by the given functional division (service);

the list of jobs and services in the corresponding units;

the quality of work (coefficient determined according to the KS UKP);

the effectiveness of the utilization of resources, the responsibility for efficient utilization of which is borne by the given functional division (service); the economic effect expected from the introduction of the plan for increasing the effectiveness of production through measures that depend upon the given division (service), thousands of rubles.

The proposed system of established planning indicators orients internal cost-accounting subdivisions toward the achievement of high effectiveness and good quality of work. It does not include certain of the quantitative indicators which were used previously, for example the volume of output in value terms. This is explained by the fact that the fulfillment of volume value indicators in the number of cases stands in contradiction to the achievement of high qualitative indicators. Thus striving to fulfill the plan for production volume "at any price" the production collective is motivated to produce what is "advantageous" and not to produce what is "disadvantageous" from its own standpoint. It becomes disadvantageous to regularly lower the norm of expenditures or to improve product quality. The indicator of the volume of products produced in value terms (rubles) or norm-hours can be utilized expediently as a calculation indicator. Its fulfillment is monitored by economic services since it is used for planning, accounting and evaluating the labor productivity that has been achieved.

A principally new aspect is the inclusion among established indicators of the indicator that characterizes the level of the utilization of resources. The question of how to utilize the production potential most completely and effectively is one of the most difficult. Branch methodological recommendations suggest directly planning and taking into account the effectiveness of the utilization of resources when evaluating the final results. It is suggested that the system of indicators include particular ones that characterize the effectiveness of the utilization of the most important kinds of production resources: means and implements of labor, work time and monetary funds. These indicators taken together with others characterize the difficulty of the subdivision's plan.

The effectiveness of the utilization of resources is determined according to one or two indicators which are selected taking into account the peculiarities of the subdivision, the tasks facing it and the conditions for operation. It is evaluated on the basis of the passport of the enterprise, shop, section or brigade; the system of progressive norms and normatives; and established assignments for efficient utilization of resources. If there are no normatives for one kind of resource or another, the association (enterprise)

calculates them independently and establishes the values of particular indicators under the established policy. Here they take advantage of the achievements of leading enterprises of the subbranch which have similar production.

The cost accounting interrelations of internal subdivisions and their material responsibility are regulated by a specially developed system of measures which includes a model classifier of cost accounting claims. Economic sanctions are applied against a subdivision which has violated cost-accounting commitments. It must make reimbursement (fully or partially) for material damage. At the same time the reported value cost-accounting indicators are adjusted (wage fund, sum of expended material values, cost-accounting savings) for the subdivision that is to blame and the subdivision that has sustained the damage. Coefficients are used which reduce the value and adjust the normative level of the comprehensive coefficient of quality (according to the KS UKP).

The results of the cost-accounting activity of production units and also the final results of individual workers are evaluated on the basis of the coefficient of the labor contribution.

But how is their labor contribution determined? The effectiveness of production and the quality of work cannot be evaluated by any single indicator (for example, the reduction of the production cost or the growth of labor productivity and so forth (since each of them characterizes only one aspect of the multifaceted production activity). Moreover the effectiveness and quality of work at various levels of management (in the work position, in the brigade, in the sections, in the shop, in the enterprise and in the division) are manifested in different ways and in some cases they are simply incomparable.

In recent years the majority of economists have come to the conclusion that it is necessary to have a unified generalizing (integrated) indicator of the effectiveness of production which depends upon a multitude of factors. Such an indicator has been applied for several years already in the Ministry of Instrument Making, Automation Equipment and Control Systems. With its introduction it became possible to compare the results achieved by the enterprises, subdivisions or workers and to reveal the degree of their deviation from the normatives. It became possible to obtain an objective evaluation as a result of each management unit and to determine its labor contribution to the final results of the work of the production association (enterprise). Such a generalizing indicator is calculated in the form of the consolidated (integrated) coefficient of the labor contribution of the economic unit.

The coefficient of the labor contribution is a generalized quantitative evaluation of the final results of the cost-accounting activity of the collectives of production subdivisions, and for individual workers--a generalized quantitative or qualitative evaluation of their labor. It is calculated on the basis of partial evaluation indicators, a sample list of which is presented in the table. The composition of the evaluation indicators that characterize labor contribution of the production units, shops, sections, brigades, divisions and services is established by the management of the enterprise.

Table--Sample List of Particular Evaluation Indicators Recommended for Inclusion in the Coefficient of the Labor Contribution

(1) Специфические показатели	(2) Структурные единицы ассоциации			(3) Подразделения промышленного предприятия				(4) Работники	
	(5) Промышленное предприятие	(6) Экспериментальный завод	(7) НИИ, КБ	(8) Цех основного производства	(9) Цех вспомогательного производства	(10) Секции, бригады	(11) Дивизионы, службы	(12) Работники	(13) Инженеры и технические работники и служащие
(14) Поставка (выпуск) продукции, выполнение работ и услуг в установленной номенклатуре (ассортименте) и в заданные сроки	+	+	+	+	+	+	+	+	+
(15) Повышение производительности труда	+	+	+	+	+	+	+	+	+
(16) Повышение качества продукции, выполняемых работ и услуг	+	+	+	+	+	+	+	+	+
(17) Снижение затрат на 1 руб. продукции (работ, услуг)	+	+	+	+	+	+	+	+	+
(18) Повышение эффективности использования ресурсов	+	+	+	+	+	+	+	+	+
(19) Экономия, полученная от внедрения мероприятий по плану повышения эффективности производства и рационализации и изобретательства	+	+	+	+	+	+	+	+	+
(20) Снижение затрат и привлечение резервов по инициативе работников	+	+	+	+	+	+	+	+	+

Key:

1. Evaluation indicators
2. Structural units of association
3. Subdivisions of industrial enterprise
4. Workers
5. Industrial enterprise
6. Experimental plant
7. NII, KB
8. Shops of basic production
9. Shops of auxiliary production
10. Sections, brigades
11. Divisions, services
12. Workers
13. Engineering and technical personnel and employees
14. Delivery (output) of products, performance of work and services on the established list (assortment) and by the given deadlines

15. Increase of labor productivity
16. Improvement of quality of products and performed work and services
17. Reduction of expenditures per 1 ruble of product (work, services)
18. Increased effectiveness of the utilization of resources
19. Savings obtained from the introduction of measures in plan for increasing production effectiveness, efficiency work and inventions
20. Reduction of expenditures and disclosure of reserves on the initiative of the workers.

In order to calculate the coefficient of the labor contribution one sets the normative value at 1. If the coefficient is equal to 1 this means that the planned assignment has been fulfilled by 100 percent with respect to all evaluation indicators. The actual coefficient of the labor contribution is determined on the basis of its normative value using increasing and decreasing coefficients that evaluate the degree of overfulfillment or underfulfillment of the plan with respect to particular evaluation indicators.

In the basic provisions concerning bonuses for workers in production associations (combines) and enterprises of industry, for the basic results of economic activity³ they have determined the basic requirements for the system of requirements. These envision direct dependence of the amount of the bonus on the amount of the labor contribution of the worker and the collective and they help to avoid equalization in the awarding of bonuses.

In order to meet these requirements in practice the Ministry of Instrument Making, Automation Equipment and Control Systems has developed and is supplying methods for distributing the bonus part of the material incentive fund among subdivisions and workers. This establishes a direct dependency between the bonuses and their labor contribution: the consolidated labor coefficient of the contribution of the subdivision (Kvp) and the worker (Kvr) is used as the basic evaluating and fund-forming indicator. A general algorithm has been suggested for the distribution of the bonus fund in direct dependence on the labor contribution of the collectives and of each worker.

Problems and Prospects

The school conducted in 1984 entitled "Experience in Improving Intraproduction Cost Accounting in Instrument Building" (Exhibition of the Achievements of the USSR National Economy) they summed up the results of the introduction of intraproduction cost accounting at enterprises and associations of the Ministry of Instrument Making, Automation Equipment and Control Systems, generalized advanced experience, and reveal difficulties and factors that impede successful application of cost accounting methods. The prospects for improving intraproduction cost accounting and increasing its effectiveness are linked to the changeover of the branch in 1985 to the conditions of the large-scale economic experiment in expanding the cost-accounting independent of production associations (enterprises) and increasing the responsibilities of the final results of their work.

One must say that comprehensive intraproduction cost-accounting management is not being used at all in industrial enterprises and associations of the branch.

What is the reason for this situation?

First and foremost the imperfect economic mechanism that is in operation in industry. Unfortunately we have not yet created the economic conditions for management whereby cost accounting would be the only possible, objectively necessary method.

The restructuring of intraproduction norm setting and planning is slow and not always comprehensive. At a number of enterprises they have prolonged the development of progressive technical and economic norms and normatives for all kinds of utilization of production resources. The norms and normatives for the expenditure of material resources and the utilization of equipment, instruments and fittings are not always submitted to the brigades and not at all enterprises, and systematic analytical accounting has not been organized.

Up to this point we have not evaluated the merit of the passport--documents certifying the production capabilities of the cost-accounting subdivisions. As a result, as before, we have imperfect methods of substantiating planning assignments and evaluating their fulfillment.

Labor collectives and workers are encouraged mainly for the fulfillment and overfulfillment of the plan without taking into account the production potential or the planning data. This does not contribute to the adoption of difficult plans or to objective evaluation of the results that have been achieved.

The higher agencies are still limiting the operational and economic independence of internal subdivisions with a large number of established planning indicators.

The introduction of effective accounting and control of the effectiveness of the utilization of resources is being held up in a number of enterprises because of the disorderly storage and issuance of materials, instruments and other resources, the incomplete provision of weight and measurement equipment and control-measurement instruments, and poor mechanization and automation of initial and consolidated accounting.

Not all enterprises have eliminated the equalization in the distribution of bonuses from the material incentive fund for the final results of the activity. In a number of cases there is no direct dependency between the bonuses and the actual labor contribution, and this does not stimulate the achievement of high quantitative and qualitative indicators.

FOOTNOTES

1. "Methods of Comparative Analysis, Evaluation of the Level and Improvement of the System of Cost-Accounting Management in Production Associations and Enterprises of Instrument Building," Novosibirsk, 1982; "Methods of Comparative Analysis and Evaluation of the Completeness of Cost Accounting and Its Improvement in NPO's of Instrument Building," Novosibirsk, 1982.

2. "Standard Methodological Recommendations for Improving the Organization of Intraproduction Cost Accounting in Instrument Building," Novosibirsk, 1982; "Methodological Recommendations for Comprehensive Improvement of Cost Accounting in Scientific Production Associations of Instrument Building," Novosibirsk, 1984; "Recommendations for the Introduction of Brigade Cost Accounting," Novosibirsk, 1984.
3. Approved by decree of the USSR State Committee for Labor and Social Problems and the Presidium of the AUCCTU of 24 July 1980.

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WORK UNDER BRIGADE CONTRACT DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 96-116

[Article by V. P. Serikov, Hero of Socialist Labor, Chairman of the All-Union Council of Brigade Leaders in Construction (Moscow): "A Brigade From the Future?"]

[Text] Obviously many readers of our magazine are familiar with the name of the celebrated brigade leader Vladislav Pakhomovich Serikov. Working at construction sites of the north he and the collective under him laid the basis for the assimilation of the brigade contract in the construction industry. Years have passed but this experience remains crucial to this very day and its significance goes beyond departmental and branch frameworks. The merits of V. P. Serikov and his brigade have been highly rated--many workers have been awarded orders and medals and the brigade leader has been given the title Hero of Socialist Labor and Honored Construction Worker of the RSFSR, and he has also earned the USSR State Prize as a prize of the USSR Council of Ministers. Today Vladislav Pakhomovich works as the deputy director of the Center for Scientific Organization of Labor and Production Management of the Ministry of Heavy Construction. He is the author of several books in which, without avoiding difficult points and contradictions, he contemplates the essence of the problems of the life of brigades. In the polemical article offered today for the readers' attention he develops the subject touched upon in his book which has recently been published by Politizdat, "A Contract of Conscience," and also in an essay by N. Maksimova, "Brigades at the Crossroads," which was published in EKO, No 2 for that year.

Brigade Leader, Create Your Atmosphere!

In the essay entitled "Brigades of the Crossroads" this idea is expressed. It is impossible to organize brigades only for the sake of increasing labor

productivity, in order to improve the enterprise's economic indicators. I fully agree with this opinion. Indeed, with such an approach in the brigades they frequently see only an effective form of labor organization, forgetting about the fact that this is primarily a collective, people. It sometimes happens that when improving organization of labor no special accommodation is made for the people and the administration deprives the brigade of the right to independently make vitally important decisions: the enterprises themselves select the composition of the brigade, appoint the brigade leader, impose upon the workers the method of distributing wages, and so forth. Such an approach is frequently encouraged and called businesslike. But this is a serious initial mistake. Because of it the development of the brigade slows up, the workers do not see the common sense in this administrative, arbitrary association, and they do not consider themselves to be a collective. They develop a mistrust and a cautious attitude toward one another which only shortsighted organizers could call comradely demandingness. The growth of labor productivity is quickly replaced with idle time and a decline, as has happened in the brigades depicted in the essay. These are the natural consequences of a "purely economic" or, more precisely, a consumer approach, which in the final analysis turns out to be impractical and leads to a distintegration of the brigades.

Let us be consistent. If we are to be oriented only toward labor productivity we must use as an example for everyone brigades who work on the weekend. For not a single plant or construction brigade can compare with them with respect to this indicator. Because the moonlighters set for themselves a strict goal: to earn as much as possible in a short amount of time. And they usually work for several months at the limit of their physical capabilities. It is impossible to work that way permanently, for years. I have absolutely nothing against moonlighters: about 30 years ago material difficulties forced me to spend a season in this kind of work. Various kinds of people end up among them and they are certainly not all greedy. But they are joined together in their job only by a desire for high earnings. And this is what forms their interrelations--and therefore their experience as a whole should not be considered progressive although we could quite possibly utilize some elements of it (for example, contractual payment for a final, concrete product).

But still my presumption that with a narrow consumer approach to brigades moonlighters can be considered the leading ones is not so absurd. I became convinced of this when I recently became acquainted with the experience of one brigade which is called a leading one. It carries out construction in rural areas. The specialists report excitedly that the members of this brigade each earn 350-400 rubles and more. they are also proud of the fact that seven people in the labor collective have a higher education and 12 have a secondary specialized education. What is so good about this: the state has spent money on educating these chaps and they are not using the knowledge they have acquired and performing work which could easily be handled by people with a 7th-8th-grade education. I asked what they do in their free time and what joins them to one another. And it turns out that nothing joins them together except their obvious desire for good money. So in what way are these engineers different from the moonlighters? But specialists who publicize the experience of the brigade are not interested in questions like these. Yet I am alarmed by this fairly typical situation; it shows that a consumerist

attitude toward brigades leads to a confusion of important concepts. It would be worthwhile to take a closer look at all of the collectives whose experience we are generalizing and think about the height to which certain of our leading lights are calling us.

"The main thing in the brigade contract is man," I told one correspondent about 15 years ago. This was not an empty phrase. It was not without reason that in our brigade day room there hung a poster which said: "Our goal is to develop a good person and out of him we shall make a good specialist."

Now all of our leaders must engage in education. And each one understands this task in his own way. I also know some chiefs who have a critical attitude toward all kinds of informal relations and nonproduction agreements among workers. I also had occasion to visit taciturn brigades where the people work intensively and joylessly. It is uncomfortable in them and the people feel constrained and it would seem that they have completely forgotten how to communicate. After this shift they run to the various homes as if they do not want to see each other any more. Such collectives are also called leading ones! But I should like to ask: is there a collective there?

In my opinion a collective begins precisely when people start paying attention to each other and are interested in each other and when they engage in discussions that have nothing to do with work. We talked about almost everything during our dinner breaks and smoke breaks! About international politics, about hockey, the movies, the theater and love.... I supported this unforced atmosphere and wanted to create a brigade--a family. It seems that this is what is became. Within the brigade there appeared many families--there were many weddings, and some workers brought their friends and relatives to visit us. We shared out sorrows and joys and we knew what it meant to give selfless comradely mutual assistance. With the entire brigade we helped people cope with the difficulties in life.

For a long time a young worker was unsuccessful in placing his child in a kindergarten. Because of this his wife was unable to go to work and a difficult material situation arose in the family. I accompanied his family to all the kindergartens and finally came to an agreement with the head of one of them to place the child there. But she asked that in return we would repair all of the kindergarten's sanitation equipment. We sent several people from the brigade there for an entire week....

Another chap told me that he had received a sad letter. His mother had written him that everything had fallen apart in her little home. We decided to send him home to help his mother. Within a week and a half he had built a new house in the village--he had put the walls together, done the carpentry work, put in the windows, and even delivered the stove. The relatives who had come by to help him were surprised: where had he learned to do all this? "In the brigade." And he, like many others, had come to us without a profession...

I know that we can be reproached for "permissible forms" of comradely mutual assistance: they might say that we have violated discipline, sent people away from the construction site and they were still credited with 8 hours of work.... Indeed that did happen. But on these days the brigade worked

harder--to make up for their absent comrades. We have held on tightly to our friendship which might be called mutual workers' responsibility and even to this day I do not consider it a negative phenomenon even though disapproving opinions regarding this have begun to appear in the press and in research literature. I think that A. S. Makarenko was right when he said that mutual responsibility (of course, on a high moral level) is needed by the collective and without it there is no comradeship. The collective must have the right to make such decisions and take such actions: otherwise the reserves of human spirit in it will gradually dry up. Our mutual responsibility can quite correctly be corrected as the manifestation of collective responsibility. The brigade has independently (sometimes at its own great risk!) made serious decisions and taken on responsibility for the results of these decisions as well as their consequences. And now there has appeared a tendency to give current production needs precedent over high moral concepts: friendship and comradeship. This is the only way I can evaluate the appearance of the method of collective responsibility whereby the managers can deprive all of the brigade's workers of their bonus for a violation that has been committed by one of them. With this kind of approach it will be difficult to find collectives who will voluntarily engage in the education of people. This will cost too much out of their own pocket and out of the family budget.

In my opinion, managers who do not delve into the life of their brigade and demand of it only one thing--increasing labor productivity--simplify things too much. As a rule, in the collectives under their jurisdiction there is an atmosphere which might be disciplined but it is also joyless and work becomes intensive and fatiguing so that it exhausts the soul. Our brigade worked hard too but frequently we felt such inspiration that it seemed that we were ready to move mountains. For us the words "joy of labor" were not an abstraction. How does one create such enthusiasm? Neither methods nor instructions can teach this.... I have noticed that on sunny, warm days the brigade does not work as well. This kind of weather is rare in the north and people want to spend time in the sun and relax. For a while I acted as though I did not notice the "nonworking attitude": let them have fun in the warm weather. Then I climbed up on the highest "point" at the construction site and shouted: "Brigade, halt!" They all stopped working. Even those who were going somewhere stopped. I asked each of them where he was going. "To get a new shovel." "The one you have is all right. And where are you going? There... for the third time?" And all of this not in a harsh tone, but jokingly. And they all laughed, including those who were "caught at the scene of the crime." After that the brigade quickly fell into its ordinary rhythm and worked with enthusiasm. I noted that from time to time the boys would begin to feel like taking a break and having some fun, but to get them back to work all they needed to hear was the familiar command, "Brigade, halt!"

Those hours, days and weeks which we spent in production were the most significant part of our lives. In this life there must be small and large joys, interesting thoughts, disputes and other affairs; it must be bright and filled with various kinds of events. And so (I return again to my initial point) the entire point of the activity of brigades cannot be reduced simply to fulfilling the plan, obtaining high earnings, economizing on materials and carrying out other daily economic tasks, even though they are important in and of themselves. Sooner or later the developing collective will begin to feel

crowded within this framework. I think that the brigade should be regarded first and foremost as a primary state unit, and its goals should be large, socially significant, and go beyond the framework of the enterprise and its purely economic tasks.

I certainly did not understand this truth at the very beginning of my brigade activity. And the brigades which I headed did not immediately become crowded within the production framework so that the socially significant goals did not appear in the first stage of development.

At the very beginning the goal was elementary--earnings. The 1950's came, the postwar difficulties had their effect, and many families were still a long way from full material provision. The quite justifiable desire for good earnings at that time caused general laborers (that is, people without an occupation) to enter my brigade and in a short period of time they mastered the specialties of masons and carpenters. After that they learned a couple more occupations (during the time of the flourishing of the brigade certain workers had mastered seven or eight specialties). We became universal workers, one of the first comprehensive brigades which constructed facilities that were "ready for operation," which logically led us to the brigade contract. A certain amount of time passed, the brigade began to have more money to spend, and it started to feel a certain indifference, complacency. I understood that they needed motivation, some interesting new job or otherwise they would stagnate. And then it was also necessary to go beyond the production framework. At first I had the idea of establishing contacts with students in the school and the GPTU. Then the boundaries of patronage work were expanded--we began to meet with people who were in jail and in prison colonies, and we began to communicate with youth who were serving in the armed forces.

I know that many people laugh skeptically: I had found something to strike the imagination--occupational orientation and patronage work, which is now included in the plans of many brigades! But that which is reduced to a formal load for many had living content for us, it became a need. Although initially not everyone in the brigade liked this idea. But then things developed so that even during dinner break the chaps would run over to the GPTU to set up a time for the next meeting and even on Sundays the women in the family would find time to visit the people under their patronage. What did our troubles bring us? The patronage was of great practical advantage--both for the construction site and for the people. We said: "We train our own personnel!" We did not take advantage of the services of a personnel division--on the contrary, we ourselves helped to provide the construction site with good replacements because young people were glad to work and work for us. One time 70 discharged soldiers came to us at the same time. Then they organized a new brigade in the administration and its brigade leader was one of our best workers. But the contacts with the school and the GPTU after a couple of years produced an effect which we did not expect at all: the school, which had previously suffered from a shortage of students, had to declare a competition--there were 770 applications for 300 positions.

It was especially meaningful for us to supervise people who were serving a sentence. In the past several members of the brigade for various reasons had also had to spend time in jail. Now they wanted to help people whose

biographies had been just as difficult, especially adolescents. The brigade easily found a common language with them and it seems to us that our words and our example were very convincing to them. Each year we accepted into the brigade one or two people from the prison colony--and they became established in the collective and turned out to be skilled workers and good people.

In the school we did not present the children with the traditional praise of our profession and did not give them lectures about the advantages of exemplary behavior. They learned everything about us and about our work at the construction site where they came not as tourists, but as friends. We argued with them about life and sometimes we went to the theater together. A cultural trip for us now means a semicompulsory joint attendance of some extracurricular activity. We have started presenting the most interesting polemical demonstrations and plan them a year in advance. Then sometimes we would discuss the play with the artists and children until late at night. Heated discussions would also break out, and it was necessary to carry them over until the next evening in the school's activity hall. I do not know who was more necessary to whom: we to the children or they to us. But these meetings were events for us: it was as though we broadened the horizons of communication and opened up new possibilities and qualities within ourselves and within our comrades.

During the meeting with the 10th graders one of them said that he did not believe the conversations about man with a communist awareness; he thought man would always remain the same--with his weaknesses, doubts and vices. Our electrician Viktor Trushkov replied: "You are wrong. There are people with a communist awareness even today." And he told a story which until that day had been unknown to me, to the brigade and to the leaders of the section. During one stormy night the power lines for our entire construction site were down. The second electrician on duty from Aleksandr Filippov's brigade came here on his day off; all day and all night in the blizzard and the 40-degree-below-zero weather he spent restoring the electric power line. On Monday morning throughout the entire immense construction site it was dark, and only in our areas could one see lights burning. The brigade did not have to take time off or declare an "emergency." The electrician Trushkov, when he came on duty, saw in the day room the exhausted Sasha Filippov who was bandaging his hand, which had been cut by the icy wires....

And there were many of these almost heroic deeds. I am convinced that such manifestations of enthusiasm and self-sacrifice are more possible if the people are joined together by heartfelt comradely relations. It is perhaps only in such an atmosphere that a need can arise for great, socially significant deeds. And that social work which in many other collectives is broken down into senselessly boring measures has become attractive and meaningful and has aroused lofty feelings. I have seen how the people have changed and grown--and I am convinced that we owe this to a considerable degree to the patronage work, especially the communication with the children. Indifference and skepticism have crept in in some places; the young people, happily competing with one another have expanded the limits of their qualifications; many have developed interesting diversion (one of the workers mastered the art of television repair with his own hands, another one made a radio and went on the air as a shortwave operator). Almost all of them have

tried to become individuals. Each one has his own opinion on any production or nonproduction issue, his own position.... I began to feel that I did not have enough knowledge and was sorry that I was unable to complete all eight grades; I tried to read more in order not to damage my authority as a brigade leader--not only as a professional, but also as a person.

We had no time at all left that was absolutely free, that is, empty. I remember that our good worker who once in the past loved to drink too much, Nikolay Vilyakin, once said with a joking reproach: "Well, look what you have done to my life, Pakhomych! A whole year has passed and I have not had time to take a drink!" And we are now straining our brains thinking about how to fight against drunkenness....

Even though it was all difficult I was glad about what had happened with the people. This seemed more important to me than our production successes, although we were proud of them. The brigade was considered to be one of the best not only in the construction sites of the north. Our experience was studied at all-union conferences and schools, and it was described in the newspapers. It was just a pity that at that time nobody saw the main thing that lay behind the brilliant production achievements: the brigade had set up a social experiment. Independently, without even relying on assistance from scientists. I had not been fortunate in my contacts with modern science: all of those brochures and methods regarding brigade organization of labor which had fallen into my hands seemed like products of a laboratory mind which were far removed from life. But still I gained a great deal from the works of Anton Semenovitch Makarenko, whose ideas are becoming timely again today. In the books of this realistic educator I looked for an answer to the questions that were bothering me.

"Privileged Conditions" for Leaders

To this point certain of the people with whom I have been speaking have smiled incredulously when the subject got around to the successes of our brigade. We know, they say, how they "make" leaders and initiators. Most likely the idea of the brigade contract was suggested to you by the leaders themselves, they created all the conditions for you, arranged ideal supply, and so forth.

Nobody played nursemaid to our brigade and it was not put forward as a "model" for an initiative. We advanced ourselves. This is why some of the managers of the trust were cool toward us at first as though we were out of step. They ignored our suggestions and did not wish to recognize us as advanced workers and leaders. In addition we were too obstinate. We did not always agree with the managers if they were pursuing purely departmental interests, frequently we brought up questions of principle at conferences and meetings, and we were also known to write to the newspapers about irregularities. In general we were not a brigade, but a "method of scoundrels." And it was not a model contingent: some of the people had complicated biographies. (Incidentally, the press was subsequently shamelessly silent about this. In articles and essays they tried to ennoble us, to fit us into an exemplary demonstration mold.)

When we announced that we wanted to work according to the brigade contract method, in the Trust and Construction Administration they did not even want to hear about this. They said I was full of harebrained schemes and certain managers even took me aside and advised me to "drop this matter." And it was only when with the help of some journalist friends I made my way to the all-union radio and announced that our brigade would accept a contract for the construction of a central heating station and summoned the Zlobin brigade competition that the managers of the trust had nothing left to do but "support the initiative."

And then we began to create conditions for ourselves--taking an informal attitude toward those issues which many had become accustomed to resolving formally. Later, when I had occasion to visit other construction sites, I repeatedly saw how certain brigades would conclude agreements for a contract. Someone from the administration would read the text and everyone would shake hands in agreement--the whole procedure took 15 minutes. Then the agreement was violated just as easily--and the construction workers also felt easy about this. They knew that they would receive their money anyway, that the supervisor would alter the records. But we would spend several days on concluding the agreements. We called in all of the associates, suppliers and the client. If somebody did not show up we called them again and put off the discussion until the next day. And there was no indifferent unanimity; the workers would vote against certain points; they argued, made adjustments, and the entire brigade would spend a long time editing the text. Our agreement could be broken too--but we already knew our partners by faith and we knew whom to go to and demand that conditions be fulfilled. We were also able to help them. If our associates (sanitation technicians, bricklayers) did not arrive at the site on time because of some good reason, we ourselves began to do their work--our great universality which we had acquired even before the brigade contract came in very handy here.

Defective parts would arrive frequently from one enterprise. The suppliers hoped that we ourselves would put them in the proper condition. But this would have taken us a good deal of time and it was not worthwhile to encourage the slipshod workers. Therefore we refused to accept the defective parts. In order to teach the brigade a lesson the suppliers refused to ship us any parts at all for about 20 days. But we had plenty of work and each worker, who had mastered several specialties, knew what to do in the event of bad weather or interruptions and deliveries. The plant workers "gave in" and they did not send us any more defective parts.

One time a plant for reinforced concrete items refused to accept our order because its shops were overloaded. Then the brigade went to the director of the plant and made its own agreement with him that it would construct a new testing ground for the enterprise almost completely out of waste materials. With one stipulation: that the brigade that would work on the testing ground would manufacture items only for our facilities. Again it was necessary to violate the formal policy: we temporarily assigned our own workers to the plant for reinforced concrete items and we credited them with 8 hours on the time sheet. The testing ground was constructed in a month. This made it possible to give the "green light" for deliveries of reinforced concrete to

our brigade and this helped the plant considerably in overfulfilling the annual plan.

Yes, in making many responsible decisions independently we frequently violated the established policy. This happened because it became too crowded for the collective within the traditional production framework. And probably not just any brigade should push up against this framework and overstep the bounds, but rather they should be revised and changed, granting the brigade space for initiative and development. Much is written about this but in practice they still frequently try to "crowd" the brigades into the framework which it has outgrown. This is what happened to us. It was necessary for us to become violators especially frequently when the managers of the trust and the construction administration, not believing in the brigade, began to intervene in the organization of labor and made decisions about the sequence for the performance of work, about the placement of the forms of the brigade and so forth. But we acted in our own way, not always according to the instructions of the administration. Before each responsible stage I suggested that the brigade think about how best to organize the work--and they brought me 15-20 variants of decisions and I was left to select the best one or to create a generalized variant. But although the managers of the construction administration and the trust were convinced that the decisions made by the collective itself were more effective, who were frequently punished for "arbitrariness." I was relieved as brigade leader. The brigade would not agree to this. The administration punished the stubborn brigade using a tested method: for a certain amount of time it "cut off" supply. And again we lived through a difficult time without halting our work. After this I was "rehabilitated" and became the brigade leader again.

This is how we made the suppliers and the associates and the trust's administration deal with us. In the end our independence was "officially recognized" and they no longer tried to solve problems related to the life and activity of the collective without our participation. Only once was this rule violated. When I was sick and in the hospital for a half month the managers of the association began to worry about the destiny of this responsible object and decided, without even consulting the brigade, to render it assistance and to "reinforce" it with 20 people from other collectives. I returned from the hospital and was thoroughly confused. At the construction site there was a lot of bustle, scandals and people from outside wandering around with nothing to do. The supervisor was working for the night, he himself was running a crane, but still he did not manage to provide everyone with materials. The brigade was nervous. I sent all of the assistants back, the brigade regained its rhythm and we fulfilled our commitments on time.

Sometimes people ask me how many members a brigade should include. At first I myself was in charge of a brigade consisting of 17 people. After I had gathered experience and force I felt that we were not large enough. We could not take on a large object and we did not manage to prepare the work front for our associates. Then I (with the permission of the administration) gradually increased the brigade to 100 people. We worked that way for a year and I began to feel that it was difficult. I reduced it to 70 people all at once. I worked with a brigade this size for 20 years. From my own practice I know that it is not easy to make a consolidated brigade into a collective with a

unified will--everything here depends on the brigade leaders. But it also has many advantages. In my opinion it is more difficult for a small brigade to set for itself socially significant goals and it has less opportunity for development. Almost all of our risky measures which ran counter to the traditional ideas concerning production policy would have been impossible for a small collective. It would not have been able to overcome the difficulties and trials which fell to our lot. There would have been less possibility of helping one another in arranging daily affairs.

Who Will Set a Fair Coefficient of Labor Participation?

I have noticed that equal pay for labor is preferred most frequently in small brigades where they have selected people of approximately the same age who are joined together by friendly relations. I myself began in such brigades and was also probably able to say at that time, like the heroes of the essay in EKC entitled "Brigades at the Crossroads" who had no doubt about the fairness of equalization: "We all work the same." In saying that, of course, they meant not the same labor productivity in terms of pieces of work, but the same enthusiasm.

Now I am firmly convinced: there is no such thing as people who are alike either in terms of capabilities or in terms of qualifications or in terms of enthusiasm. Well, in a large brigade the KTU [coefficient of labor participation], in my opinion, is necessary. For instance, 70 people can certainly not all work the same. Incidentally, in our brigade the person who obtained the highest coefficient most frequently received it for enthusiasm and for the ability to work in the collective and keep up with its main goals. Our KTU was differentiated and we made calculations right down to the hundredths. But still I cannot say that we achieved absolute precision. Perhaps our punishment seemed too severe at first glance. And we could raise the coefficient--for incentive. But there were no conflicts because of the KTU. Although there did exist a time period for complaining about incorrect decisions--3 days. But nobody used this even once. This means that in spite of the obvious imprecisions our KTU was close to fair. Why? It seems to me that we were able to determine it with our hearts. And a computer, which the researchers suggest using instead of this calculation of coefficients, would not give us that.

We did not distribute all of the earnings according to the KTU, but only the bonuses. We announced who was given which coefficient only once, at a brigade meeting. We never posted these results on the "blackboards," or the "screens." I do not think that this kind of publicity is altogether ethical. It only causes unnecessary psychological tension in the collective. I also have a cautious attitude toward the experience of those brigades where the KTU is posted each week and sometimes each day. In my opinion this also makes people nervous: the mutual control becomes too strong, and a worker does not manage even to correct a small mistake without immediately being given a low rating for this. Our KTU's were posted twice a year (when the assignment was fulfilled according to the contract). If the brigade saw that a person was not working well, that he tended to be lazy, it was promptly suggested to him that he catch up. It was still possible to make up for what was lost and receive a high coefficient.

I think that we had no conflicts from the KTU also because there was a real labor council in operation in the brigade. Initially, when we had just begun to introduce the brigade contract, our council was a formal one, as it is in many brigades. I was in charge of it. I myself provided all the leadership of the collective and made all the responsible decisions alone. At that time I was "infallible"--nobody made any critical remarks about me. Everything changed after it was decided at one of the brigade meetings that neither the brigade leader nor his deputy and certain not representatives of the administration should be included on the council (this idea was "suggested" to me by A. F. Makarenko. Do you recall how skillfully he developed the collective, correctly distributing the duties and trusting the council of leaders to solve all of the crucial problems? When I left the council it turned out that I had plenty of shortcomings--both in my work and in my attitude toward people. They began to look me straight in the eye and talk about this. Our relations became more direct and honest.

It even happened that the council reduced the KTU for the brigade leader (when I was traveling to a conference regarding the brigade contract and the brigade ended up in a difficult situation during that time). Once they punished a worker in authority (in spite of my defense of him). He had not fulfilled the duties of a supervisor, which led to idle time during the shift. The council immediately called an extraordinary session and adopted a decision: to reduce his KTU. I intervened: "This chap was just awarded an Emblem of Honor, you yourselves shook his hand, and now for one mistake you punish him so severely." They excluded me from the discussion: "Get out of here, we will figure this out for ourselves."

"Public agency" is not frequently understood as something as formal and secondary. The true meaning of this concept was generated in our brigade. The council was elected all over again every half-year--so that nobody would get settled in and lose their sense of justice. The council could argue with the brigade leader and with the administration. And even reprimand them. It engaged seriously in production problems, especially the utilization of mechanisms, supply and organization of labor; it could hear the report of the brigade leader and give him its recommendations. I will not say that I liked the criticism or that I always immediately agreed with the decisions and evaluations. But I understood that the collective was becoming what I had one time dreamed about. Practically all the workers went through the school of management in the council. I was convinced that many of them could lead large brigades themselves. And indeed 15 brigade leaders came out of our collective and many of them have been honored with government awards.

Now in certain construction subdivisions they have begun to create economic councils which include representatives of the workers who reelected twice a year, practically permanent representatives of the administration (the chiefs of mobile mechanized columns, managers of trusts, head engineers and so forth) and leaders of public organizations. Recently I saw a television program about such an economic council. A meeting was in session. The workers sat on the sidelines as a passive group and the managers and engineers allocated the coefficients for the brigade members. An argument started about some worker who was being unfairly criticized (they said that they reduced his

coefficient. I have repeatedly recalled this episode, discussed it with specialists who were interested in collective organization of labor, and I was interested in the principles of the activity of the economic councils. But I was not able to dispel my doubts completely. Was the economic council taking a correct course? After all, when developing collectives we must develop democracy and approach worker self-management, and was the economic council which was shown on the television not taking us further away from this? And did the brigade council really start to argue: was the worker drunk? They probably knew whether he was or not.

It would probably be more convenient to solve many large economic, personnel and organization of problems jointly--with the administration and the workers (if, of course, the participation of the workers in the economic council does not amount only to their formal presence). But such an economic council should not divide up the money according to the KTU or solve other problems of the internal life of the brigades. A fair KTU can be set for the workers only by the workers themselves. I have become convinced of this through many years of experience of our "council without the brigade leader." I am also still confident that only such a council is capable of becoming the social agency that displays the most initiative and is the most militant and authoritative.

But this is my personal opinion. It is possible that I am wrong. But I think before the authoritative agencies begin to issue recommendations and instructions regarding the activity of economic councils or any other undertaking related to collective organization of labor it is necessary for them to comprehensively study the experience of yesterday's and today's brigades and not to be too hasty in making conclusions or taking what is desired for what is real, as is frequently the case.

When It Is Time To Leave the Brigade....

An important issue was touched upon in the essay from EKO entitled "Brigades at the Crossroads"--concerning the attitude in the brigade towards newcomers, toward elderly people and toward people whose health and physical capabilities do not allow them to work under stress. Unfortunately, this problem is avoided in the press--possibly they do not think that it is worthy of serious attention. But this is wrong: this problem requires attentive and critical consideration--there is a broad field for sociological analysis here! This difficult issue has also arisen in our brigade in spite of the generally friendly atmosphere. After all, the collective has taken on high commitments and they had to be fulfilled within strict time periods. Therefore in our brigade two unskilled newcomers were a heavy burden--at first the collective actually did "process" them (I will go ahead and use this word which is perhaps not altogether not sympathetic but has come into common usage). But we did not try to avoid them since we understood that without youth there is no future, we tried to teach them as quickly as possible and helped them to become established in the collective. Not all of those who came here became established; some of them were not capable of keeping up with us or withstanding the severe conditions of the north--it was necessary to work both in blizzards and in freezing weather. They left and we did not condemn them or try to keep them. So there remained in our brigade mainly the strongest and hardest workers.

An especially difficult problem is what to do with elderly people who have worked in the collective for many years and who are no longer as strong as they used to be. I think that if the general rhythm is too tiring for them they should leave the brigade. It would be possible to find for them other work which they could do at the same enterprise. Or they could be sent to the GPTU where they do not have enough experienced production workers. But how to enable them to retain their previous earnings and whether or not it is always necessary to do this--it is necessary to think more about this.

From childhood, from our school days on we are taught to think that it is necessary to select one occupation for our entire life. I think this is wrong. Each person should prepare himself for a possible change in his life and activity brought about by a change in the condition of his health or the way he feels, and each person should have his own variant in reserve. Then an atmosphere like the one described in the aforementioned essay will not arise: the situation in which the brigade is burdened by the elderly worker since he is no longer keeping up with the overall intensive rhythm and is clearly lagging behind. The administration acted correctly by granting him the possibility of working separately, not in the brigade. It is a pity that this decision was not made until after the appearance of a difficult psychological situation.

It is typical that this happened in a small brigade. A consolidated brigade has its advantages here. An elderly person can be assigned to teach the newcomers or one can find other employment within the brigade which is within his capabilities. A pensioner worked in our collective for several years. He did work which was easy but necessary, and which nobody else wanted--he kept the instruments and dayroom facilities in order and performed one-time assignments for which there was no hurry. Nobody grumbled because we were "processing" him. We have always had the possibility of offering easier work to those who do not feel well on a particular day. After all, that can happen to anyone. In a smaller brigade there is practically no possibility of this.

Several years ago I myself felt that my strength was not what it used to be and my health began to decline. At that time I left the brigade. I decided I could be of more use in another place. In the Ministry of Heavy Construction they offered me work involved with the introduction of the brigade contract in industrial construction. That is what I am doing even now. I have had to visit various parts of the country and many construction sites. I have never been satisfied simply with conversations with managers and have gone to the brigades and talked with the people in the work positions--and after these contacts, as a rule, I have formed an idea of the life of the brigades which is different from the descriptions of the representatives of the administration. I have been convinced that not only workers but also many specialists still have a foggy idea both of the long-range goals and today's tasks of the brigade contract. The majority of the brigade leaders whom I had occasion to meet were skilled specialists but they were unable to "create an atmosphere" or to plan "tomorrow's joys" which Makarenko discussed. Certain of them complained about their dual position and felt that they were an "intermediate link" between the workers and the administration. In the past I myself did not feel this duality, I felt only that I was a worker and I

defended the position of the brigade if I was convinced of its correctness. I never tried to strike a balance between the brigade and the administration. I advised the brigade leaders to be more principled in solving any production or nonproduction problem and not to be afraid to enter into conflicts: after all, the development of the collective is impossible without them. I have said and I still say: one must beware not of the discovery of contradictions but of their concealment, an artificially created unanimity.

These numerous meetings motivated me to write a couple of books containing my reflections about my own experience and about crucial problems in the life of brigades ("Profession--Brigade Leader," "Agreement of Conscience" and others). I was glad to learn that the brigade leaders whom I met later had not only read my books but had also taken a good deal from them for their own practice. This means that my current activity is of use. It is significant and interesting in its own way although I still think that there is nothing more interesting than the work of a brigade leader. And regardless of whose experience I learn about I still automatically compare it and check it against my own past experience with my brigade which has become for me a kind of standard, a point of comparison. Sometimes my brigade seems to me to be a collective out of the future. And in fact did we not jump 2 or 3 decades ahead in our development? I do not like to think that, possibly, everything is the other way around and that atmosphere has become outdated....

Frequently the people with whom I talk are interested in knowing how my former brigade is working now and whether or not I maintain contacts with them. For the past 5 years I have not managed to get away and go to Murmansk, but my comrades have come to see me in Moscow many times and discussed what is going on today. Of course "my brigade" as such no longer exists. The collective is almost completely made up of new people: some of the old ones have gone on to their pension, and some have left the North. The brigade is known for its high production achievements. But they say that the meetings in the administration are no longer as stormy as they were when our previously collective was accomplishing its deeds and making its decisions that went beyond the framework of customary ideas. Apparently the current updated collective is no longer so audacious and obstinate since the atmosphere in the SMU has become more peaceful.

But I believe that the social experiment which our brigade began in the 1950's is not completed. It will be continued in other collectives. And sooner or later they too will feel constrained within the stereotypical framework and they will feel an insistent need for more socially significant goals and projects.

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ECONOMICS OF BOOK PUBLISHING DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 117-125

[Article by I. D. Trotsenko, director of the "Ekonomika" Publishing House (Moscow): "The Economic Book: Demand and Production"]

[Text] Each commodity satisfies a particular need of man or society. A book is a totality of ideas, definitions, information and other manifestations of human awareness, it satisfies the spiritual needs of man and society, it contributes to the development of culture and therefore it is an important part of the spiritual wealth of mankind. The latter (like material-substantial wealth) does not depend on the commercial form of production.

Hence a serious distinction between a book and other commodities. While acquiring a commercial form and embodying expenditures of a particular quantity of paper, cardboard, colors and other materials, the book at the same time is a product of man's spiritual activity, a source of information, a determination of economic, political, moral, aesthetic and other views and ideas of the society.

To plan and evaluate the work of a book publisher with the book being considered only as an ordinary commodity is not only incorrect but also harmful because such planning would not take into account the main purpose of the book--to serve to satisfy the spiritual needs of the society. For scientific planning the book publisher needs to know these needs and to account for their volume, nature, essence and kinds.

Of course in publishing books one cannot but take into account the fact that the amount of the demand determines the production of the commodity. It is no accident that books intended for the most widespread needs are published in large quantities: works of artistic literature and books about sports, homemaking and so forth. The next group includes publication for which there is not such a widespread demand, mainly literature for workers in branches of the national economy. Finally, there are books for small groups of specialists employed in various areas of material and spiritual production.

The mechanical extension of the laws of commercial economy to book publishing places publishing houses in an unequal position. With state planning of

production factors which is the same for all, the publication of books that are in mass demand turns out to be much more advantageous than the publication of monographs. But this is not even the main thing. For the society the amount of the demand for a book and the importance of the spiritual need which this book satisfies are from being the same thing. In many cases the publication of narrowly specialized monographs for which the demand is limited produces a much greater social effectiveness (economic, production, scientific and so forth) than does the output of popular literature.

And this is understandable. In any branch of the national economy there are narrow but responsible areas in which a small number of highly skilled specialists are employed. The society does not need to increase the number of these but without their activity it is impossible for production, science or technology to develop successfully. In order to satisfy the demands of these specialists it is necessary to have a small number of books whose publication is disadvantageous from the standpoint of the commercial economy. But in this case is it possible to be guided only by considerations of profit? After all a scientific idea embodied in the material of a book must be evaluated primarily from the position of its influence on the life of the society and not from the standpoint of the monetary return on the book.

Of course if we refrain from publishing books at a loss for a certain amount of time the specialists will get by with the knowledge and experience they have accumulated and information gleaned from other sources. But sooner or later their qualifications will decrease and the theoretical level of research and development will drop. It is difficult to overestimate the harm from this. Apparently when planning the output of narrowly specialized literature one should proceed not from considerations of profitability, but first and foremost from the essence and significance of the social needs which it is called upon to satisfy. It is necessary to determine precisely the range of demands which a given book satisfies and, in keeping with this, to establish the volume of the edition; to determine whether the content of these demands has been revealed profoundly enough; and to deliver the book precisely to those points where it will be a real consumer value.

It is most difficult to meet the first and third conditions. This again is related to the peculiarities of the consumer value of a book. They consist in that the book is first and foremost a spiritual good and one which has a strictly individual direction.

But now frequently today the lack of a demand for a book in a given store (oblast, republic) or unsold remainders in the warehouse evoke the reprimand: the society does not need the book. But it is simply a matter that the book is not a real consumer value in the given store (village, city). In other places and in other segments of society there may be a great demand for it and it is not impossible that this demand will go unsatisfied.

When planning the publication of books and setting prices for them one takes into account, of course, the fact that the book takes on the form of a commodity even though the main point is the essence and social significance of those spiritual values which it satisfies. This way various nominal prices have been set for various kinds of literature (prices for one printer's sheet)

and these determine the retail prices. Thus for sociopolitical and agitational literature the nominal price is 1.8 kopecks, for monographic and scientific-theoretical literature--6 kopecks, and for works of modern poetry--10 kopecks. This means that if in these areas three books of the same volume are published (say, 10 printer's sheets each) the retail price of the first will be 18 kopecks, the second--60 kopecks, and the third--1 ruble.

In recent years the conditions for the publication of certain kinds of literature, above all monographs, have deteriorated. This is related to the increase in prices of paper, printing work and so forth. Since the nominal prices (and this means the retail prices as well) have changed little or have not changed at all, the cost of the book has risen and their profitability has decreased. Many small editions are now published at a loss. How does one increase the profitability of book publishing under these conditions? Some publishers have come to the opinion that since the prices are firmly regulated by the state and the production cost has increased, the only path is to reduce the proportion of books that are printed at a loss or even completely refrain from printing them and to increase the percentage of high income publications. Hence in many cases people judge the value of one book or another according to the possibility of publishing a large edition of it and obtaining high incomes. Certain people think that even though it is possible to publish unprofitable books, in any event they should not be published at a loss. There has been a kind of "antimonographic" campaign for limiting the publication of specialized literature for which there is a relatively small demand.

It seems that these positions would not hold up under criticism even from the economic standpoint not to mention the political and ideological standpoints. The overall profit depends on the price, the production cost and the number of books sold. An increase in production cost with all other factors remaining the same indeed does require larger editions--this is the only way to obtain the previous incomes. But such an approach to a book, especially a specialized one, is unacceptable. The limits on the sales of scientific monographic literature are dictated by its content and not by the production cost. Specialized literature by its nature is intended to satisfy the spiritual demands of a limited range of people. F. Engels wrote that "real economic works should be primarily detailed research and therefore they are not intended for mass sales."¹ This pertains also to scientific work in history, philosophy biology, chemistry and so forth.

Let us envision an ideal case: exactly as many copies of the book as are required have been published, but the cost of publication has increased. What must we do? In order to maintain the previous income from the book it is possible to increase its price. This is what would happen with the unlimited effect of the law of value. But the Soviet state keeps price regulation in its own hands. Under these conditions it is possible to maintain the previous income level in two ways: either to refrain from publishing the book at a loss and replacing it with a profitable one or to increase the circulation of the published books. These are precisely the demands made by those who see in the book only an ordinary commodity, that is, its ability to be transformed into money.

But in both cases these demands stand in contradiction to the interests of the socialist society. If one expands the publication of the book the quantity of it could exceed the amount of the spiritual demands for whose satisfaction it is intended. If one halts the publication then the corresponding spiritual demands will go unsatisfied. Consequently, regardless of the conditions on the book market, the task of planning is to provide for correspondence between the number of books published and those spiritual demands which it is called upon to satisfy. One must say that so far this task is being handled poorly. Today the planning of book publication is in the hands of book trade organizations. They collect orders for the publication of books and then fill them and, naturally, they are interested primarily in publications for which there is a mass demand and which produce large earnings.

The very mechanism for gathering orders for the publication has not been worked out. For example, when determining the need for specialized monographic literature workers in book trade do not even have statistical data concerning the overall number of people who are working in the given area. Therefore the editions are formed to a considerable degree under the influence of subjective factors. This is predictable because even the most qualified worker in the book trade is not able to keep up with the affairs of all branches of the national economy,, science, technology, culture and art.

Today publishers put out books only in the quantity which is determined by the book trade organizations. But there is almost always a lack of correspondence between the supply and demand even for monographic literature: in trade there is a critical shortage of certain monographs while monographs in other areas are unsold. But even for the remainder rules are applied which do not take into account the peculiarities of the book as a consumer value.

In statistics many goods (watches, cameras and so forth) have come to be called durable goods for cultural and domestic purposes. As compared to these the book is a super-durable good because it can serve for many generations. But this obvious truth is in no way taken into account: there exists a rule that a book which has not been sold for a number of years is to be written off as unnecessary to the society. But this is a paradox and here is why.

The Ekspolizma Publishing House released the book by D. I. Rozenberg, "Commentary to K. Marx's 'Das Kapital'." Let us imagine that this book was delivered to all corners of the country and some of its editions had not been sold after 5-7 years. This would serve as evidence of the economic fact that the supply of the book had fully satisfied the demand for it. And what should be done with those that were left over, burn them in as scrap paper? Of course not. In the interests of the society it would be expedient to temporarily remove the book from the market and keep it in the warehouses, and after a certain amount of time it would again be in great demand. Such a book must be evaluated not according to the profit or losses which it brings, but the role which it plays in the society--contributing to a deeper understanding of the great work of K. Marx and a manifestation of interest in politically significant as a constituent part of Marxism.

Recently an attempt was made to determine the size of editions of monographs using mathematical, and certain managers of publishing houses thought that

the majority of books should be turned over to subscriptions. Of course the society is interested in making sure that each book is published in the quantity which is required in order to satisfy its demand. And the system of taking subscriptions would be capable of determining the volume of spiritual demands only if this were done according to the principle of "the commodity seeks its consumer." That is how we have organized subscriptions for newspapers and magazines--practically everyone can find out at his place of work or residence which periodicals can be subscribed to.

As distinct from this kind of subscription, for books (monographic) it was organized according to the directly opposite principle: "The consumer seeks the commodity." In so this it is necessary to go to a special store which accepts subscriptions for various kinds of literature at various times. Information about this is not provided satisfactorily and on top of all this the trade organizations are not materially motivated to handle small editions. And so it turned out that only a very few specialists were able to subscribe for the books they needed.

As a result the editions of monographic literature were extremely small (for the publishing houses cannot publish literature in a larger quantity than that determined by the trade organizations) and such books were produced at a loss. For instance, the Ekspres Publishing House in 1982-1984 published many books whose editions were determined according to the subscription. The edition of each was from 700 to 1,500 copies. Among them were books on such crucial subjects for the national economy as the determination of production costs, the effectiveness of scientific research, the organization of the sociological service at enterprises, management of the agroindustrial complex, and so forth. The publishing house sustained large monetary losses from their publication. But what was even worse was that the illusion was created that the corresponding spiritual demands were satisfied (after all, the size of the edition was determined according to subscription!) while in reality thousands of specialists were deprived of important scientific information. The books were from this so difficult to determine since it will be manifested only in the future, but it will definitely be manifested.

The same thing is happening in other areas of book publishing. Thus to the question of why very little literature is published about resumes, the editor of the Sovetskii Gosplanizdat Publishing House, V. Kikis, answers that the publications are ordered by trade organizations and the latter demand the output of large editions of variety and price from the "star" repertoire while the order "for resumes is not exceed 500 copies." Let us think for a minute what would it mean to forget about the Russian resume and not install a love for it in modern youth? This means depriving them of the possibility of partaking in the invaluable treasure chest of national culture and impoverishing their spiritual world. Is it really possible to pass up the chance to make a loss with monetary profit from the sale of state goods?

Beginning with the 1980s plus the practice of having subscriptions for monographs was abolished, but the peculiarity of the book as a consumer value (and as a special kind of commodity) is still not sufficiently taken into account.

Although a book is consumed individually the results of this consumption have a social effect which cannot be included in the measurements of a commodity-monetary economy. Therefore it is also impossible to evaluate the merit of the book without taking into account the social effect produced by its publication. It would hardly be correct to demand of a publishing house the kind of cost accounting (khozraschet) that would make it necessary for each published book to produce a profit. With the increased production cost in unchanged prices this is simply impossible because for many monographic publications there is no need to increase the circulation. Since the main task of the publishing house is to satisfy the spiritual needs of the socialist society, among which there are narrowly specialized ones along with mass ones, the social necessity dictates the publication of both large editions of books and small editions of specialized monographic books. As concerns issues from specialized literature, they can be covered through the publication of books that are in mass demand. In practically any publishing house there is a possibility of extensive maneuvering.

It is important to learn to reveal the volume of the demand for monographic literature with scientific accuracy. And at this point it is expedient to increase the role of the centralized basis in determining the volume of circulation. The book as a unit of value has a consumer value created by the author, the workers of the publishing house and the printers. Workers in book trade transform the consumer value of the book into a particular monetary sum. Since the acts of producing a book and selling it on the market are organized separately, the commodity producers are to a considerable degree separated from the market where their products are sold.

It is necessary to increase the role of the publishing house in the determination of the sizes of the editions of monographic and specialized literature. This, in turn, will benefit with such agencies as the USSR Russian and Central Statistical Administration, various ministries and departments as well as book trade organizations. The leadership of this work is provided by the USSR Government. This will make it possible to determine the sizes of the editions of monographic literature taking into account the number of specialists and also the demand for the given literature on the part of state and public organizations (libraries, scientific research institutions, various commissions, bureaus and so forth). Additionally, the publishing houses should participate more actively in the determination of those points where it is necessary to send the published books and where they will be most likely to secure real consumer values.

Of course centralized determination of the sizes of the editions of monographic publications still does not guarantee that all of the books that are produced will constitute the needed controlling reserve. Some of them can go unused. But with this policy there will be less of a danger that some of the spiritual needs of our society will not be satisfied. The losses from unused literature will be divided up as before mostly between the publishing house and reader, but it is better to make up for this loss for the work unused to mankind by the shortage of scientific information. And today we have the evils of the same time: on the one hand the spiritual demands of the specialists are not being fully satisfied and on the other hand specialized monographic literature which is distributed according to subscriptions is

causing immense losses for publishing houses because it is being published in extremely small editions.

How does one scientifically determine the demand for specialized literature? One can select 30-40 narrowly specialized subjects from various areas of knowledge and first try to establish the size of the edition for each subject centrally and then hold a subscription for them according to the principle of the "commodity seeks the consumer." Then each potential consumer should have a real opportunity to learn of the subscription and to order the book he needs in the place where he works or lives. The difference between the two methods will show the degree of error with the centralized determination of the editions.

Today a book is largely subject to the laws of monetary circulation. While it is not only a material, but also a spiritual wealth of the society, an indispensable part of socialist ideology. Taking this into account one should also improve the planning of book publishing.

FOOTNOTES

1. Marx, K., and Engels, F. "Soch." [Works], Vol 38, p 456.
2. See SOVETSKAYA ROSSIYA, 6 January 1984.

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CONDITION OF PUBLIC CATERING SERVICE SURVEYED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 127-133

[Article by B. G. Shelegeda, candidate of economic sciences, Donetsk Institute of Soviet Trade: "What Can Public Catering Do: Tasks and Reserves"]

[Text] In olden days they used to think: "Bread and water are necessities, everything else is a luxury." The better we live the wider the range of things we need, things which quite recently were "luxury items." What we more and more frequently find ourselves short of is free time. We shall discuss this extremely important but up to this point not fully utilized reserve for increasing free time and improving health--the satisfaction of the needs for efficient provision of food at public catering enterprises.

This is a special need. All others are formed and grow if the most essential need is satisfied--the need for food. Each of us values having beauty and comfort around us or wearing something elegant. But if we are deprived of this kind of satisfaction our health will probably not suffer too much. As for food, its quality directly influences the health and determines people's mood and ability to work. Varied and tasty, attractively presented dishes which are sold without delay in public catering--this means saved time, protected health, increased labor productivity and a good mood. Poor quality of culinary products and service end up in losses not only for individual people but also for the society as a whole.

Currently we receive wastes, even if they are food wastes, products which have been transformed into rejects while manufacturing meals. And yet the raw material was raised in agriculture, processed at food industry enterprises, transported repeatedly, stored, weighed and accounted for. Why after processing is it not consumed? "It does not taste good, I do not like it, it is not what we would like it to be...." say those who are dissatisfied.

Incidentally, about food wastes--wastes of products which have been prepared and been on the table of the consumer but have not been consumed. What other branch can "boast" about the fact that its enterprise has wastes planned as a part of the prepared products? (After all, this would be the dream of people who produce defective products!) And yet in public catering where the enterprises are dealing only with the "final" consumers these are planned

periods.¹ As a result, the interests of public catering and the consumer do not coincide. A tasty meal will hardly go to waste. If they have not fulfilled the planned assignment for the sale of food wastes, the manager of an enterprise or his deputy risks losing up to 50 percent or even all of his bonus as a worker who has made production mistakes. The blame for this violation is classified as tantamount to failure to fulfill the plan for comprehensive supply with semimanufactured products and for the production of meat on subsidiary farms!

The worse the food is prepared, naturally, the more wastes there are. Demand for food that does not taste good is less and so are the earnings from each space in the dining facility. According to figures for 1982 the amount of wastes in the Kramatorsk City Administration amounted to an average of 50 grams for each dish, and the circulation of products produced on the premises per space in the dining facility was 551 rubles; in the Donetsk Trust of Dining Rooms these figures were 34 grams and 834 rubles, and in the Makeyevka City Administration--20 grams and 859 rubles, respectively. Moreover, right at the enterprises of the aforementioned organizations raw material (vegetables, meat and fish) is almost not processed at all but comes in the form of semimanufactured products. This means that the main source of food wastes is poor-quality dishes and other culinary items. A consumer who has not liked the food in a dining room or cafe will simply not go there any more. yet everyone knows the public catering saves time and is convenient, to be sure, with one condition--the quality of public catering must be no worse than the quality of home cooking. When this requirement is not met people will not want to save their time this way and the branch sustains direct losses--underutilized production capacities, rates of growth of labor productivity that lag behind the growth of the average earnings, and empty dining rooms. And the result is that it is difficult to fulfill the plan and it is not fulfilled everywhere, especially for products that are produced on the premises, and various products and until recently alcoholic beverages and tobacco items are stolen and sold on the streets. The commodity turnover that is envisioned as early as the planning stage and is expected during the construction of new enterprises is reduced. And the main thing is that the consumer suffers, the person who, having lost faith in public catering, cannot satisfy his own needs for convenient and advantageous services.

What are the reasons for the fact that the quality of products and services in public catering is not changing for the better? Why are many dining rooms, where a large quantity of refrigeration, mechanical and heating equipment is concentrated and where skilled specialists are working, not taking measures for improving technology, organization and stimulation of labor and not coping with their main assignment--to provide for a high level of quality?

The majority of workers on the staff for the administration of public catering enterprises give the following reasons: the suppliers violate conditions of the agreements; public catering workers are not directly interested in improving quality; those in charge of production and the managers of enterprises are not able to organize the work without defects; the work load is irregular; and the monitoring has not been perfected. Many consumers think that public catering workers do not want to or are unable to prepare tasty food and some of them think that they deliberately violate the norms for

putting ingredients in meals and then they take what is left over for themselves.

Is it possible to describe all public catering workers this way, and, on the other hand, is it possible to completely remove all blame from them and shift it to objective factors?

Both approaches are wrong and this is shown by the experience of the leading enterprises which are operating under the same conditions as the others.

For example, workers of the dining rooms of the Makeyevka Metallurgical Plant imeni S. M. Kirov have every right to share in the production successes of the plant workers which would hardly have been possible if the workers had been living on cold cuts. The more so since in these shops there are quite a few people who require dietetic food--10-18 percent, for whom a correct regimen and the corresponding diets help to maintain health and the ability to work.

In the opinion of the dietitian of the ORS, in the future it will be necessary to increase the plant subsidies for reducing the costs of dietetic food and in the menu to take into account as much as possible the conditions for work at industrial enterprises. Standard books of recipes recommended for all branches of industry need to be adjusted, taking into account the specific features of the workers' labor. The development of variants of complex breakfasts, dinners and suppers for workers in the mining, metallurgical and chemical industry was actively begun more than 10 years ago and public catering workers are requesting that it be continued.

The fact that in public catering it is economically advantageous to work well is shown by the figures in the table.

Table--Economic Indicators of the Operation of the Test Dining Rooms of the ORS of the Makeyevka Metallurgical Plant imeni S. M. Kirov in 1983

<u>Indicators</u>	<u>In Public Catering of ORS as a Whole</u>	<u>Dining Room 1</u>	<u>Dining Room 2</u>
Commodity turnover, thousands of rubles	7346	466.9	652.6
Output of products produced themselves, thousands of rubles	4692	251.8	326.3
Number of places in dining hall	6342	530	300
Number of workers	996	52	66
Including production workers	560	28	34
Commodity turnover per one space, thousands of rubles	1.16	1.42	2.18
Commodity turnover per one worker, thousands of rubles	7.4	9.0	9.8
Output of products produced themselves per one production worker, thousands of rubles	8.4	9.0	9.6

The values of the resulting economic indicators in the dining rooms where the food and service are excellent are much higher than the average for public catering in the ORS. When evaluating the quality they took into account the responses from workers on questionnaires and in discussions as well as data from laboratory analysis and inspections by agencies of intra- and extradepartmental control. It is no wonder that the collectives of these dining rooms have been winners in socialist competition for a long time. In any city there are enterprises like this and not only public catering workers but also residents know about them. The opinions here coincide fully even though there is no unified methodology for comprehensive evaluation of the quality of products and services yet and there is no systematic accounting for these indicators.

In public catering it is impossible to prepare full-value tasty dishes from low-grade, substandard raw material, and they cannot be prepared in the necessary assortment either. And what they do manage to prepare from poor raw material is either harmful to the health or else it is thrown away.

The processing of this kind of raw material is also economically disadvantageous. For example, when peeling 100 kilograms of potatoes 40 percent of them have gone to waste, in order to fulfill the production program where the recipe calls for 100 kilograms of potatoes (net), it would be necessary to peel 167 kilograms, that is, the labor-intensiveness and along with it the output depend directly on the quality of raw material. Receiving meat with higher norms and percentages of bones than is envisioned (in places where the enterprises have not yet been changed over to working with semimanufactured products) leads to direct losses. There are cases in which one kilogram of meat (net) costs the dining room 3 rubles and more and the consumer pays 2 rubles 63 kopecks (according to the price list). So there is a negative result: the expenditures on labor, raw material and transportation are not reimbursed.

Is it possible even today to provide public catering with high-grade raw material? It is possible if we recall the directive decisions concerning priority supply of high-quality products for public catering. It is possible if the funds for production raw materials are allotted to public catering on a par with trade and the oblast public catering administrations are not subordinated to the oblast trade administrations when it comes to this issue. It is possible if we make not only public catering itself responsible for the quality of the raw material, but also those who have manufactured and shipped poor-quality raw material to the enterprise.

It is no secret that fairly frequently workers of dining rooms and restaurants have occasion to hear from their suppliers: "Prepare something from these groats (curds, fish, potatoes, vegetables....) (that is it: something!)--the defects are not so obvious in prepared dishes." But taste can establish quite unerringly that the raw material is of poor quality!

A second important aspect of the problem is, paradoxical as it may sound, the lack of interest on the part of public catering in improving the quality of its dishes.

Is the manager of the enterprise responsible for quality? He is responsible but after he has fulfilled the plan. And so they say: "We must not only feed the people, we must also fulfill the plan." When are cooks given bonuses for the high quality of their food? Again under the condition that they fulfill the plan for the turnover of products which they produce themselves. And how does one judge the quality of the dishes? From the results of inspections and from entries in the books of complaints and suggestions.

Why have additional bonus payments not been envisioned for the manager of the enterprise (or his deputy) for high quality of products and services?

Bonuses are now paid to administrative workers for fulfillment of the plan for commodity turnover under the condition that they provide for high quality of products and services as envisioned by the provisions concerning bonuses but they are not equal to the bonuses for quality. And if it rejects substandard raw material the public catering enterprise may not receive a bonus at all. Many useful instructions and rules have been written to protect the interests of the consumers but until the enterprise is given the opportunity to select its own suppliers the situation will not change.

The attitude toward planned indicators must be changed radically. Quantity should not take the upper hand over quality but vice versa, the more so since in public catering the volume of production depends completely on sales. It is impossible to prepare food for future use and therefore the fulfillment of the commodity turnover plan by the public catering enterprises depends on the volume of sales, and sales depend on the quality of the food and service. According to data from our research, up to 30 percent of the workers at industrial enterprises refuse organized hot meals during their dinner break simply because the quality of the food is not high enough.

We should not only orient planning toward the fulfillment of assignments for commodity turnover and output of products they produce themselves, but we should also radically change the attitude toward quality indicators.

It would be expedient to change the organization of planning, incentives and control, guided by the principle: "What is good for the consumer should be good for the public catering enterprise as well." Here it is important to have a nonformal attitude toward the introduction of a system for control of the quality of labor and a comprehensive system for control of the quality of public catering.

Perhaps we have spread things a little too thick but the problem that has been raised is so crucial that we cannot limit ourselves to a list of the traditional successes. Of course they exist--in the increased number of comfortable restaurants, in the improvement of working conditions, in the higher level of qualifications of the workers, and in the higher level of technical supply. But these successes will be more appreciable if we solve the most important problem which is raised today for public catering--improving the quality of products and service.

FOOTNOTE

1. According to the recommendations for efficient utilization of raw material and the model calculation of assignments for gathering food wastes by public catering enterprises of the Ukraine (1985), the average norm of wastes per one meal is 21 grams, including in workers' dining rooms--20 grams, school dining rooms--19.5 grams, student dining rooms--24 grams, and in restaurants--23.5 grams. In Donetsk Oblast in 1985 public catering organizations were given the assignment for producing food wastes in an amount of 43 grams per meal. As of 1 January 1985 the proportion of enterprises that had been changed over to comprehensive supply with semi-manufactured products, that is, relieved of the duty of processing raw material, amounted to 82 percent in the oblast. This means that all hope is being placed on the plates of the consumers....

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REGULARITY OF PRODUCTION PROCESSES DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 134-155

[EKO round table discussion, text prepared by B. P. Kuttyrev: "Production Rhythm: How To Control It"]

[Text] The club of directors in Pavlodar selected as its subject the rhythm of production. Participating in the meeting were: the leader--director of the Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences. Academician A. G. Aganbegyan; general director of the Pavlodarskiy Traktorny Zavod imeni V. I. Lenin Production Association, Yu. A. Luzyanin; his deputy for economics, V. G. Varonin; the deputy for production, O. R. Gorte; the secretary of the party committee, V. S. Zhigulin; the directors and other managers of enterprises from Divnogorsk, Krasnoyarsk, Kursk, Magnitogorsk, Novosibirsk, Orsha, Sverdlovsk and Tiraspol, and also a number of associates of the Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences.

Straightening Out the Concepts

Yu. A. Luzyanin: What does the production worker dream of? Probably most of all of continuous work rhythm. The more frequently the interruptions, the more one dreams about this. But wishes alone are not worth much. Regardless of how hard we try we will still have interruptions as a kind of law. Today the second and third sessions will not be working because there are no transmissions, which are delivered to us from Omsk.

How do we break out of the grip of rush work? What must be done in order to arrange continuous operation of production? How do we enter into a rhythm that is necessary and convenient for everyone? I should like to receive answers to these questions from science and from my colleagues.

A. G. Aganbegyan: These questions are related to the formulated group of tasks for imposing order and strengthening discipline, increased production effectiveness and the solution to social problems. It is also necessary to respond to these questions in connection with the economic experiments. Rhythmic operation has always bothered practical workers to one degree or another, but today they require a new, nontraditional approach which would make it possible to achieve a significant result. The general features of such an approach are known: it should be comprehensive, systemic and program-target oriented. Today our task is to disclose the main provisions in the concrete forms for the realization of such an approach which would help production workers to establish an efficient, uniform rhythm.

V. D. Rechin, candidate of economic sciences, Novosibirsk: It would be difficult to find a specialist in production organization who would not join into the discussion on problems of rhythm--it began about 2 decades ago. Even I have not stood on the sidelines, being involved in a subject that is related in the closest way to rhythm--reliability of production. V. Ye. Adamov, a well-known specialist in this area, counted about 100 indicators of rhythm. Subsequently the boom died down although apparently the situation with respect to production rhythm did not get any better. I have tried to conduct an analysis of the tendencies in production rhythm in industry, using various indicators for this.

The same indicators were also used to analyze production rhythm in 1981, 1982 and 1983. The fluctuations in electric energy in the Pavlodarskiy Traktorny Zavod Association were considered. As a rule, on Monday one begins with a growth of expenditures, the peak of the expenditure is reached on Thursday, and then there is a decline. Sometimes the peak comes on Wednesday or Tuesday, but not on Monday--such is the established rhythm.

From the standpoint of the theory of the reliability of production, of the multitude of indicators of rhythm (more precisely--uniformity) the most suitable is the coefficient of variation of the average linear deviation from the average (V) which expresses the uniformity of the course of production:

$$V = \frac{\text{Sigma } |X_i - X|}{\text{Sigma } X_i}$$

For example, the main conveyor produced conventionally during the first session (X_1) an average of 40 tractors, during the second session (X_2)--60 and during the third session (X_3)--65, and so the average per session (X) was 55 tractors. Then $V = 18$ percent.

The proposed indicator of rhythm (uniformity) is different from those used in the association or those prescribed for it from above--10-day output of commercial products and the coefficient of rhythm determined on the basis of this. These indicators characterize not so much the course of production as the course of the dispatch of products. If for the first 10 days they actually did produce 10 percent of the total monthly volume of commercial products and during the third 10 days--60 percent as is shown in the report,

it would logically follow that during the last 10 days the association would produce 6 times more commercial products than during the first 10 days. Yet in reality during the third 10-day period they removed from the main conveyor in comparable form, that is translated into one working day, only 16 percent more tractors than during the first 10 days. And this was not only at the PO PTZ; these indicators are typical for machine building and many other branches.

Ten days is too long a period for evaluating rhythm and the working days are not all the same length, so that it is difficult to compare one month with another. Moreover, because of the imprecisions in information which are difficult to eliminate, the data for the first 10 days are regularly reduced and for the third 10 days they are increased. The real difference between the first and third 10-day periods in the PO PTZ is not 16 percent, but less than 10 percent. The data for rhythm can be used, but only for the most general and rough evaluations.

G. V. Grenbek, candidate of economic sciences, Novosibirsk: Quite a bit has been said and written about rhythm in recent years. Results of special research using methods from mathematical statistics have appeared; the corresponding sections have been included in certain training aids on economics, planning and organization of industrial production. Nonetheless there is still no clarity in the definition of the concept "rhythm." At least three positions can be determined.

One of them, the "classical" position, in my opinion, the only correct one, is defended in the works of Professor S. Ye. Kamenitser. In order to describe the production process he uses the uniformity of work and the uniformity of the output of products understood as the equality of the volumes and the corresponding work, on the one hand, and the output in various time intervals, on the other. The concept of "rhythm" is generally not used, and work rhythm is considered only in terms of the flow line as in organization and technical parameters. Moreover rhythm is used to describe one of the forms of the organization of batch processing in series production--the input and output of batches of parts with the same name (components, assemblies) through various time intervals.

The second position is presented in the article in the "Soviet encyclopedic dictionary": "Production rhythm, the degree of uniformity of the output of products during a year, month, day or shift." Obviously, here the concepts of "rhythm" and "uniformity" are equated, or rhythm is used as an indicator or measurement of uniformity.

The third position requires a delimitation of these two concepts with the help of various indicators. Thus Z. N. Neyman asserts that uniformity characterizes the degree of equality of the volumes of produced in various time segments and "rhythm characterizes the degree of precision of planning assignments for individual time intervals for which they are established," and in series and unit production the coefficient of rhythm should reflect only negative deviations."

B. P. Kuttyrev, candidate of economic sciences, Novosibirsk: In my opinion an analysis of the human factor in production helps to draw a distinction between "rhythm" and "uniformity." Historically the work schedule took form in a way that was close to the natural rhythm, but it is not uniform: at various times of the year, months, weeks, day and night in nature there are different numbers of events, but they are in a certain rhythm which the life activity of people also follows. But perhaps the output of people employed in production cannot be uniform. The physiological of labor recognizes its deviations during the course of a shift: the period of warming up, of high productivity, its reduction before the dinner break, again warming up after dinner, upsurge and reduction of output right before the end of the shift. The speed of movement of the conveyors also varies in keeping with this.

The rhythm of output varies within the week (biorhythms), month and year time periods, even in working life. Consequently, rhythm is not equal to uniformity, but vice versa.

O. R. Gorte: For us production workers the concept of "rhythm" is perceived most frequently through the opposite concept--rush work. The latter entails a multitude of production-economic and social problems. This means that uniformity is needed. On the other hand, the formation of these concepts in production workers is influenced by instructions from higher agencies concerning the evaluation of the activity of the enterprise. The concept is also defined depending on which indicator is introduced from above.

G. V. Grenbek: It might seem inappropriate to compare the three positions I mentioned above but not from the standpoint of those tasks which are facing us in the development of the "rhythm" target program for the PO PTZ. When a tree of problems and a tree of goals¹ are constructed it is necessary to have a clear-cut classification of problems and goals, and this is possible only with a strict delimitation of the concepts and equivalent formulations of goal points.

When developing recommendations for the "rhythm" program the following kinds of indicators were used as initial ones:

for enterprises that produce one kind of product, that is, mass production, uniformity of the output of prepared items is a direct consequence of systematic observance of the technical conditions, particularly the rhythm of operation of the assembly conveyor, and indicators of uniformity should be calculated for short time segments that are comparable to the rhythm. Then uniformity and rhythm are mutually interchangeable concepts;

with batch processing, that is, series type of production in metallurgical, processing and other subdivisions rhythmic--at equal time intervals--input and output of batches of the same kinds of parts can be used as one of the possible forms of organization and planning of work. The expediency of this form is based on engineering and economic accounting. It is not the only one: when working "for the warehouse" (the bunker form of ties with the last stages of processing) other forms of work and operational-calendar planning can turn out to be more effective;

for subdivisions and enterprises that produce many products the uniformity of output is significant only as an expression and a consequence of uniform utilization of production capacity (nonwarehoused resources). Uniform loading is an important condition for normal operation if for special purposes, for example, for seasonal increases in the volume of work, they have not provided ahead of time for reserve capacities. A more precise picture of loading and, consequently, uniformity is provided by evaluating it in norm-hours since value indicators are not suitable here;

a 10-day period for the appearance of uniformity is too great.

On the whole I agree with O. R. Gorte in that practical workers should be oriented toward that approach to rhythm (or uniformity) whereby the association is evaluated from above. But there should be a warning that monthly and 10-day reporting from the departmental enterprises on rhythm, which is established by a number of ministries and VPO's is not especially expedient. Thus even an identical (in wholesale prices) volume of 10-day output of commercial products in and of itself does not guarantee equality of 10-day loading either of the enterprise as a whole or of its subdivisions. One does not achieve an identity of the structure of output for these periods. But worst of all is the fact that the aforementioned indicators orient people toward "volume" to the detriment of the products list, they motivate people to produce "advantageous" products and they force people to "chase after high indicators."

If one proceeds from national economic interests it is necessary to achieve prompt and specific deliveries of high-quality products. And promptness is far from always the same thing as uniformity and rhythm. The dates for delivery (dispatch) and the dates for output can differ and the periodicity of the manufacture of items of particular kinds is established by methods of operational-calendar planning taking into account the delivery dates, the possibilities of warehousing the final products and the entire diversity of conditions at a specific enterprise. It is impossible to understand why systematic and precise fulfillment of planning assignments is called rhythm if the plan can envision both rhythmic output and--when necessary--irregular loading.

Yu. I. Tychkov, candidate of technical sciences, Novosibirsk: It is understandable why rhythm is accounted for in rubles: this is the only officially established method of bookkeeping which is approved in bookkeeping documentation. Another, more objective kind of accounting is daily norm-hours. With machine accounting and punch card equipment the picture is revealed completely but, true, it reflects not rhythm, but uniformity, which is necessary for the plan. Thus rhythm and accounting are inseparable.

O. R. Gorte: I do not see anything wrong with "ruble" rhythm. The NChP [normative net output] is calculated in rubles, spare parts--in rubles, and batching items and instruments--also in rubles. But still this is not the only method of accounting and reporting. There are staffs which keep track of the shortage: we check, monitor and give the appropriate incentives. Take the foreman: he will not accept a part which in terms of some parameters

deviates from the plan, the schedule and the technical specifications because at some point this will not allow him to sleep peacefully.

Yu. I. Klimov, Novosibirsk: We know about systems in which they regularly keep track of several hundred indicators and take into account all of the responsible workers. It would probably be possible to monitor rhythm as well, including in rubles, norm-hours, by the 10-day period and daily. It is apparently possible to arrange incentives too. From my viewpoint it is better to do this in 10-day periods.

Yu. I. Tychkov: The system of incentives should be flexible. In our mechanics shops, for example, a bonus of up to 40 percent is paid for rhythm, but in places where production is more stable it is less. And in the mechanics shops the proportion of bonuses for rhythm can decrease with time if the rhythm improves.

G. V. Grenbek: In stimulation of labor, as generally in the matter of accounting, reporting and forming rhythm and regularity, there can be no routine work, rules, instructions and indicators that are set once and for all.

V. S. Zhigulin: Sometimes people try to show that the output (production) during periods of rush work could be spread over all the other work periods. They even see reserves for increasing labor productivity here. The director of one of the plants in our branch had the habit of coming into the assembly shop at 2 in the morning, he would take command, and with orders that would brook no objections he achieved an impressive increase in the output of machines from the conveyor. Then he would reproach the managers for their inability to follow his example. Yet these successes were achieved only because other sections had sacrificed. The output of tractors inevitably declined until they caught up.

Yu. A. Luzyanin: In the new mechanism it is necessary to include more responsibility--state, planning, production, technological and labor discipline.

Yu. I. Klimov: I wish to give my own example. It sometimes happens that we produce 50-60 percent of our products in 3 days. And the suppliers have become accustomed to this. The material is just about to run out--and they do not lift a finger. They react only when everything is gone. Only then do they begin to make a fuss and start sending cargoes by aircraft. So if reporting in terms of rhythm were introduced this would stimulate efficient work on the part of the suppliers.

N. M. Pichugin, candidate of technical sciences, general director of the Kursk Production Leather Association: It turns out that it is as though there were two indicators--one for "external use," that is, rhythm, and one for "internal use," that is, loading equipment according to the program for the controlled period. The first indicator is necessary for controlling the sales services, which has to do with the usually irregular operation of transportation. It is taken into account in 10-day periods and in rubles. Our second indicator is a can of worms. I listen and I think: it is necessary to compare with

preceding periods, to look more deeply within the week, to reveal the influence of the human factor, for example, the way the workers feel. Well, the higher agencies do not ask about rhythm.

V. D. Rechin: I shall return to the figures that were already mentioned. If during the third 10-day period 6 times more products have been produced than during the first (10 and 60 percent, respectively), then the PO PTZ, if it were to work all the time at the level at which it works at the end of the month, with the same capacities and the same number of personnel it could produce almost twice as much. This conclusion follows from the indicator of rhythm that has been adopted. But it is wrong. In reality this degree of uniformity is unrealistic. Judging from the number of tractors taken from the main conveyor, equaling the third 10-day period would lead to an increase in output of only 8 percent per month.

G. B. Grenbek: We must first of all achieve a strict rhythm in the flow lines and in series production we must create the necessary volumes of incomplete production. It is not so much the output indicators of rhythm that are important as the creation of stable conditions for the operation of the main conveyor and all of the other productions at the enterprise.

Yu. I. Klimov: I wish to defend the indicator of rhythm in 10-day periods. It is convenient for production with warehouses that do not have large reserves and it is stipulated that the products will be released to the warehouse for a 10-day period. We have had a good deal of defective work and sometimes we have not worked it off for several days, and if the ministry had not introduced the 10-day indicator of rhythm it would have been necessary to invent one.

G. B. Grenbek: Is this indicator monitored by your ministry?

Yu. I. Klimov: Reports are required daily but on the whole, as I understand it, there is no monitoring. There are no penalties for interruptions.

I. V. Budchenko, plant director, Orsha: Experience shows that the indicator of rhythm does not work. We plan it, report on it, and it is possible to even establish incentives for its fulfillment--but it still does not work. But it is necessary to analyze rhythm: it is necessary to know one's capabilities and in coordination with indicators for which funds are allotted.

When everything is translated into rubles I can cover "small stuff" for the month, but not in 10-day periods. This is advantageous for the plant and the shortages of its current work are thus covered. In other words, nonrhythmic production makes it possible or, to put it less strongly, does not impede the fulfillment of plans in terms of value. It turns out that the indicator of rhythm, on the one hand, is urgently needed, and on the other--it is not necessary at all, and it can even be fulfilled meticulously.

G. V. Grenbek: Of course it is superfluous if the bonuses are paid for something other than what is advantageous to the entire national economy.

Table--Amount by Which Output in Third 10 Days Exceeded First 10 Days
in Value and Physical Terms; First = 1.0 (Not in Comparable Form) in PO PTZ

<u>Indicators</u>	<u>Years</u>								
	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
Output of products	6.3	4.2	4.5	5.0	6.1	4.6	3.5	2.5	3.3
Tractors taken from main conveyor	1.75	1.65	1.35	1.65	1.55	1.55	1.50	1.30	1.45

L. G. Stobbe, director of the Magnitogorsk Calibration Plant: If the 10-day indicator of rhythm is too consolidated would it not be worthwhile to introduce an hourly indicator?

G. V. Grenbek: In the first place, there is no such thing as hourly accounting. In the second place--and this is the main thing, in my opinion--are the management agencies really interested in rhythm? First and foremost it is important to them that the products get to the clients on time. And if it is necessary to change the work rhythm of the enterprise? The figure of 33 percent in 10-day periods (or other amounts in terms of hours) will only confuse them.

Z. D. Rechin: For analysis (and not for reporting to management agencies) it is expedient to study the rhythm for various time intervals: changes from year to year; for various times of the year, months, 10-day periods and days of the week, fluctuations in the average daily output, fluctuations within the 24-hour period on the different shifts and within the shift during different hours, and also within the hours. According to data from an analysis we conducted in the PO PTZ, fluctuations in the output of tractors for the various months are as follows: from January through June--an increase with a certain reduction in April, in July--a practically inevitable decline, and then an increase again with its peak in October. The production cost of the tractor fluctuates in a sufficiently similar way from year to year: the peak, as a rule, comes in July and another one in January; in the second half-year the production cost is higher than in the first.

It seems that there is an inevitable rhythm in which most machines come from the main conveyor on Tuesday and Wednesday, and fewer and fewer of them come on subsequent days of the week. Even if Monday and Friday come at the end of the month, this pattern still remains. When people work on Saturdays the average output of products is five-sixths of what it is on other days. The fluctuation of labor productivity on the various days of the week is no less significant than it is between the first and last days of the month. The differences between the first, second and third shifts are essential. The first is always a "decline." During the 10 months that were analyzed the schedule was not met on a single one of the 208 first shifts. According to averaged data on the output of tractors during each of the 8 hours of the shift, the coefficient of variation (V) for the first shift was 35 percent, for the second--23 percent and the third--21 percent (the smaller this coefficient, the higher the average labor productivity). Of course there is no irreversibility or fatality in this kind of rhythm.

Attention is drawn to the fact that each shift begins with a minimum output and ends with a maximum output. During the first hour of the second shift they produce five-twelfths the number of tractors that are produced during the eighth hour of the first shift and during the first hour of the third shift they produced five-twelfths the number of tractors that are produced during the eighth hour of the second shift while during the first hour of the first shift they produce five-23rds the number of tractors that are produced during the eighth hour of the third shift.

The fact of the maximum output during the last hour of the shift shows, in particular, that the existing rhythm contradicts the one that is dictated by physiological factors. For at the end of the shift fatigue accumulates and yet the workers intensify their labor.

How To Achieve Uniformity

EKO: From the discussion it is clear that everyone is excited about the work of an enterprise at which plans are fulfilled precisely and on time, delivery dates are observed and there is no rush work which gives rise to a mass of problems. In one case it is necessary to have a particular rhythm, in another--uniformity, and in still another--even a certain arrhythmia only it must not be random, but planned. Now let us try to see how the required production rhythm is actually introduced.

V. D. Rechin: One should undoubtedly begin with an analysis. The figures I have given make it possible to draw useful conclusions. One can also give other figures for the PO PTZ which we obtained when investigating the rhythm of operation. An analysis reveals the problems whose solution became the goal of the program "rhythm."

N. M. Pichugin: Can we clarify this: Was it precisely the achievement of rhythm that was the goal of the program or was it actually uniformity?

V. D. Rechin: Uniformity (I am using it here as a synonym of rhythm) has already been achieved in the association, but it did not satisfy the production workers. What should its new level be?

Each target program should begin with the development of a quantitative expression of the goal. The indicators used here do not make it possible to determine this goal for the "rhythm" program.

G. V. Grenbek: It logically follows from the points I have made that generally an increase in rhythm should not be singled out into a target program along with those such as "quality," "profitability," and "social." This task cannot be the most important one for the national economy or the enterprise. The main thing is to provide for the output of products according to the plan and on time, and it is less important how this is done--uniformly or in spurts. But this conclusion only shows the inexpediency of our current reporting. As concerns the decision to engage in the "rhythm" program in the PO PTZ, this was conditioned by concrete external and internal conditions for the work of the association and also tactical considerations concerning the

most appropriate methods of mobilizing the collective for the fulfillment of a complex of planned measures.

V. D. Rechin: In my opinion uniformity is the other side of reliability in production which we require. If production is reliable it can function in a given rhythm and it can be planned. Reliability is provided through a system of factors the most important of which are the following: the necessary quantity of labor force with the necessary skills; the availability of particular equipment, instruments, and technological fittings; adapters and so forth with "cold" and "hot" reserves; a sufficient quantity of means of transportation with a reserve; production areas of a particular type with a reserve; the availability of bunkers and intermediate capacities between all of the technological operations; a reliable system for maintaining production forces, including "repair" of the labor force; a system (policy) for administration of production, including incentives, provision of information and so forth.

Yu. A. Luzyanin: the realization of the "rhythm" program is closely related to other programs and depends on them. To be sure, we need first and foremost reliability in production. Our association more than any other tractor building enterprise depends on cooperation, which today does not contribute to reliability of production. Consequently if we wish to achieve rhythmic operation it is necessary to reduce the degree of dependents on the suppliers and to create a normative volume of incomplete production.

V. S. Zhigulin: Perhaps it has become a part of our psychology (and the ministry demands this) to perceive the conveyor as a pump which pumps out of all the other sections. Its existence in and of itself provides for rhythm. It dictates what everything else does. It is apparently necessary to get away from ideas like this and this means to tighten control over all the sections that are working on the conveyor. Therefore we must speak not only about rhythm of the conveyor, but also about how this is achieved and how it is broken. Georgiy Viktorovich Grenbek is right when he says that the "rhythm" program may not have any justification for its existence with the exception of the really crucial situation which has arisen in the association today.

I agree with Yuriy Alekseyevich Luzyanin and Oleg Robertovich Gorte in that one cannot achieve the required rhythm with one leap. First it is necessary to tighten control on the rear areas and this must be done with the help of the target program method.

Yu. A. Luzyanin: The association's "rhythm" program has the following basic divisions: "incomplete production," "operational administration of production," "warehouses" and "transportation." They partially intersect with the program "quality" but they also include many specific measures. All of them are important but the main one is still to provide for a supply of engines and transmissions as well as sheet metal which are parts of incomplete production.

N. M. Pichugin: How many measures are envisioned in the "rhythm" program, how many of them have been carried out, and how do they increase the reliability of production?

O. R. Gorte: The program includes about 200 measures. On the whole the results can be seen. The output of tractors, for example, increased during the first 10 days from 20 to 25 percent and during the second 10 days--from 29 to 31.5 percent. We are practically providing for the normative for incomplete production in rubles. But, of course, there is still a lot to be done.

B. P. Kuttyrev: From the social standpoint it seems important to maintain that rhythm which is inherent in man's life activity, to leave for it even a certain aspect of "rush work," but at the same time to achieve uniformity of production and growth of labor productivity. Let us assume that it would be expedient to combine the labor of two workers, one of whom has a peak of his activity at a particular time according to his biorhythm and the other--a decline at this particular time. Their output taken together will be something like an average. Or if, as is usually the case, they all begin the shift at the same time then all of them have surges of energy and declines in their ability to work at the same time. Here it would be expedient to introduce a "floating" beginning of the shift so that there will be more peaks in output.

O. R. Gorte: How does one organize the production process so that the production proceeds uniformly and the workers do "rush work"?

B. P. Kuttyrev: Practice has already provided an answer to this question by advancing a schedule or a work and rest regimen which is called "sliding work time" (SRV). So far we have no organizers like the one Oleg Rabertovich mentioned, and the workers select for themselves the most convenient time for their highest output. The SRV is well-known abroad and in our country. Unfortunately, its introduction is not envisioned in the programs, including "rhythm," but it could lead to increased regularity.

O. R. Gorte: If the workers are given the right to decide for themselves when to come to work and when to leave would this not lead to a decline in labor discipline?

B. P. Kuttyrev: Experience, including in Novosibirsk, shows the opposite. The SRV increases discipline. Moreover it is used as an experiment in strengthening order. Incidentally, many workers who have been given the right to SRV continue to keep the customary schedule, resorting to the "sliding" schedule only when necessary.

Yu. I. Tyehkov: More than 3,000 of our workers have received the right to work under the SRV. But they were not simply given this right; they had to earn it through good discipline. This right can also be taken away if discipline in the section where it is used deteriorates.

B. P. Kuttyrev: It is curious that the SRV originated in the FRG. It is as though the Germans, who are considered to be a punctual people, have changed their nature. But it turns out to be the opposite: the reduction of punctuality produced an increase in discipline. And in the FRG they are conducting experiments on a sliding work year and a sliding working life.

Yu. I. Tychkov: I know from experience that in order to introduce the SRV it is necessary to arrange for objective accounting for the amount of time worked. But this is no more labor-intensiveness than accounting with the traditional schedule and it is relatively uncomplicated if one uses computer equipment.

Yu. I. Klimov: We permit individual categories of workers, for example, programmers, to come to the enterprise at any time and we do not keep any track of them except for the results of their labor. Nobody has abused our confidence yet.

EKO: If one approaches this from the social standpoint the SRV has many merits. Here one can take into account the individual peculiarities of people, some of whom are "owls" and some of whom are "larks." Discipline and self-discipline develop and output increases. Of course one cannot do without accounting for the amount of time worked and the results of the labor of each worker. It is necessary to have a good deal of restructuring in the organization of production, labor and management. But this restructuring in and of itself should produce an economic effect.

Yu. I. Tychkov: I share the opinion about the need for a target program called "rhythm." I wish to draw attention to the centralized batching service. We borrowed this organizational idea from the Oktyubrentgen Production Association.² The interests of the workers of this service are linked to the interests of the basic production and the advantage is mutual. All warehouses for storing parts and semimanufactured products and all means of transportation have been taken away from the shops. There are no journals or card catalogues for accounting and telephone access and computer terminals are used. With these we can obtain the most varied information, for example, that certain parts from the centralized batching warehouse have never been claimed in several months, although the orders for them were planned.

But the most important thing is that the availability of objective and prompt information creates conditions for the development of functions of analysis, and hence there arises a need to create analytical services. At our plant we have organized a group for analyzing situations. So far its monthly reports leave something to be desired, but all the necessary methods have been created and it is just that certain results have not yet been achieved. It has been discovered, for example, that 30 percent of the manufactured fittings are not used for a long time. They have begun to discover items which regularly "fall away" from the schedule and the determining factors (capacities, supply, technical equipment and so forth) have been disclosed. Such conclusions are simply invaluable.

N. B. Mironosetskiy, doctor of technical sciences, Novosibirsk: I wish to emphasize the extreme importance of analysis. At one enterprise where we conducted research they had incorrectly determined the structure of incomplete production--and for 2 years they were unable to strengthen anything out, and all because of their inability to analyze. It is precisely within the framework of analysis that one must measure rhythm and uniformity. Unfortunately, in this case mathematics is still indebted to practice and has

not provided a good apparatus, although a certain amount has been done. Thus algorithm optimization of the formation of batches have not yet been developed, but individual devices, particularly nomograms, are being used successfully. The ABC method proposed by consultants is useful for the "rhythm" program in the PO PTZ.

There is no need to wait until a specific enterprise introduces a perfect system of analysis similar to the one discussed by Yu. I. Tychkov. It is based on the ASU Sigma which is distinguished by its great adaptability. It is worthwhile to look to the Altay Tractor Plant for experience. They have achieved a good deal there, particularly because of the support and enthusiasm of the general director. There is a machine system, terminals, there is less paperwork and more analysis.

A. F. Pavlova, deputy general director of the Tiraspol Production Sewing Association imeni 40-Letiya VLKSM: We have become accustomed to analysis. And we do not flag when suddenly problems appear. Analysis makes it possible for us to find a decision. We have a conveyor, 30 percent of our operations are performed by machine, and the rest are done by hand. It would seem that there would be many causes for interruptions of the rhythm. But there is no serious danger; on the contrary we are trying to individualize the output depending on the capabilities of the workers, and these differ appreciably. Are we not thus introducing something like an increased probability of nonrhythm? No, we have a system of measures to counteract this. For example, the blanks are given to the worker in bundles, and not individually. Brigade forms and mutual assistance on the conveyor also help to maintain the rhythm.

We are constantly conducting psychological, physiological and social-psychological research on various groups of workers. We are able to find out who has the greatest fatigue at what time. The brigade leader's duties include checking on the eye fatigue of the sewing machine operators. For rest and emotional relaxation we have introduced breaks lasting a total of 26 minutes per shift and we have developed and are utilizing sets of exercises to music composed of easy dance steps. It is important that these measures be included in the plan. We need a rhythm to fit the plan and a plan to fit the rhythm. Indicators of the necessary rhythm are encouraged through wages and are evaluated when summing up the results of socialist competition.

A. G. Aganbegyan: If one tries to define the concept of "rhythm" on the basis of this discussion one can say approximately the following: rhythm is a characteristic of the work of the subdivision or enterprise which reflects the condition of the interconnections among various production units and the relationship among periods of loading of the workers. The level of rhythm is high if the units function continuously, in keeping with the plan, for example for delivery, and the alternation of the load on the workers corresponds to their natural and biological rhythm as well as social habits. It is not mandatory for production to be uniform.

A multitude of measures can be suggested for establishing the uniformity and rhythm necessary for production, but they must be comprehensive and take into account the overall task of the enterprise, on the one hand, and the peculiarities of the human factor, on the other. It is possible to achieve

comprehensiveness within the framework of the target-program approach and therefore the experience of the PO PTZ in drawing out and implementing the target program "rhythm" deserves extensive dissemination. Attention should also be given to the coordination of the interests of production and workers which is provided by methods similar to the SRV.

FOOTNOTES

1. For more detail see EKO, No 11, 1984, pp 26-31.
2. Pachin, S. T., Petrushanskiy, V. A., "Centralization of Transportation and Warehouse Service," EKO, No 5, 1983.

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STRUCTURAL FUNCTIONAL ANALYSIS DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 155-163

[Article by V. N. Stakhanov, candidate of economic sciences, Volgodonsk Branch of the Novochoerkassk Polytechnical Institute: "The Utilization of Structural-Functional Analysis When Evaluating the Quality of Supply"]

[Text] The investigation of the work practice of enterprises and associations for delivering products has led us to the conclusion that it is necessary to plan and evaluate not so much the quantity as the quality of supply. But in and of itself this conclusion is still not a solution to the problem. In order to determine the ways and methods of improving the quality of supply it was necessary to formulate the very concept of quality of supply, to provide an idea of its most essential characteristics, to describe these in a system of concrete indicators and to find a quantitative evaluation. It turned out that it was best to approach the solution to this problem using the method of functional cost analysis (FSA).

Of course, in the form in which the FSA is used in analyzing functions and cost of items it is unacceptable in supply. The object of labor in the sphere of circulation does not change its physical and substantial form, but only undergoes a metamorphosis of the change in the forms of value and spatial location, a changeover from the sphere of production to the sphere of consumption. The intermediary activity of the supply agencies is in the form of services rendered to other branches of material production for planned distribution and circulation of material and technical resources. The Marxist definition of the content of services is quite acceptable for describing the results of the work of supply agencies. K. Marx wrote: "This expression generally means nothing other than that special consumer value which is delivered by this labor similar to any other commodity; but the special consumer value of this labor here acquires the specific name of 'services' because the labor renders services not as a thing but as an activity...."¹

If one turns to the main units of the supply and sales system, enterprises and associations, here the services are rendered in the form of delivering the products from the producers to the consumers in a form that is more prepared for industrial consumption. This means that the consumer value of this kind of service is expressed in the promptness, completeness, reliability and

comprehensiveness of the satisfaction of the consumer's demand in keeping with agreements that have been concluded and orders that have been accepted for fulfillment. In turn, the cost of these services is determined by the socially necessary expenditures on carrying them out.

Thus the quality of the supply and sales activity of enterprises and associations for deliveries is their ability to satisfy the socially necessary needs for delivering the products from the producers to the consumers in a form more prepared for industrial consumption. The socially necessary services are those which make it possible to maximally utilize the production potential of the suppliers and to satisfy promptly and completely the economically expedient demand of the consumers which is registered in agreements and documents equal to them concerning the delivery of products.

One of the initial provisions of the FSA consists in that the investigation should be functionally referential by nature. The difficulty of the process of supply is determined by the fact that its functions are considerably more diverse than are the functions of many objects of labor. At the same time one cannot forget about the structural functions and the results and expenditures on their achievement. For example, the function of delivering the product from the producer to the consumer consist in the form of supply--transit and warehouse--the nature of ties between them--direct or mediated by supply agencies, and so forth. Analogously, the result of the supply is also in the form of satisfaction of the demand for a specific list, consumers, deadlines, comprehensiveness and quality of material and technical resources. The functional cross-section of the analysis added to the structural one provides a basis for discussing structural-functional analysis.

The criterion for the optimum in FSA is the minimum expenditures on the item while maintaining or even the improving the quality of its functions. In supply the minimum expenditures on circulation cannot be the criterion for the optimum. Savings on expenditures in circulation can end up as considerably greater expenditures for the producers and consumers. For example, a reduction of the reserves of supply and sales organizations, as a rule, entails a more rapid increase in these for the consumers. Having saved on storage in the sphere of circulation we sustain considerably greater losses from the freezing of resources in the sphere of production. In other words, the savings on expenditures in supply do not compensate for additional losses in the national economy. From the national economic standpoint this savings is inexpedient. Because of this one can conclude that the investigation of expenditures in the sphere of circulation should be auxiliary in nature and should be directed mainly toward an analysis of the effectiveness of the utilization of all kinds of resources assigned to the supply agencies.

So it is inevitable that the FSA will be modified when investigating the quality of supply. A more expedient form of it, in our opinion, is structural-functional analysis (SFA). In generalized form the SFA method presupposes:

the establishment of the structure of qualitative characteristics of supply;
their quantitative evaluation;

an analysis of the quality of the performance of the main functions of supply and sales organization;

the establishment of deviations from the normative or planned level of quality;

a determination of the ways and means of improving the quality of the operation of the enterprise (association) for deliveries.

The block diagram of the SFA is an investigation of the final results of supply in combination with an analysis of the effectiveness of the expenditures of live and embodied labor for their achievement.

We used the SFA when analyzing the quality of supply and sales activity of the Volgodonsk Administration for Batching (VUK) which provides material and technical support for the construction of Atomash, the Rastovskaya AES and other consumers in the Volgodonsk Industrial Center. The main purpose of the VUK is to render services for providing material resources to construction facilities of the Volgodonskenergostroy Trust (VDES). The quality of these services is characterized by the completeness, promptness and comprehensiveness of deliveries. Directly related to the performance of this function are services for centralized delivery of products to the consumers, their preparation for industrial consumption, the determination of the needs for material and technical resources and their protection in planning and distributional agencies.

The quantitative description of the quality of supply was obtained on the basis of a system of coefficients that characterize one or another aspect of the supply and sales activity of the VUK. The determining criteria of quality were:

coefficients of promptness, completeness and comprehensiveness of deliveries of products to facilities of the VDES Trust in keeping with weekly and daily schedules;

the level of centralized delivery of products to construction sites;

the coefficient that characterizes the fulfillment of the plan for additional services for preparing products for industrial consumption.

After the description of the quality of supply in the system of quantitative criteria we managed to provide for a comparative evaluation of the actual and planned levels of quality of the activity of the VUK. From the results of its work during 1983 it was established that the fulfillment of assignments and commitments for deliveries reached 100 percent, the level of centralized delivery of products to the consumers was 83 percent, and the degree of satisfaction of the demand for additional services was 70 percent. True, the planning assignments for centralized delivery and additional services were fulfilled completely, but the actual needs of the consumers were satisfied only partially.

The effectiveness of expenditures of live and embodied labor in keeping with the SFA method were evaluated in terms of:

the level of development of progressive forms of supply;

the degree of mobilization of surplus and unutilized material resources through decentralized procurements;

the growth of labor productivity of VUK workers;

the level of expenditures per unit of final results.

Of all the known progressive forms of supply, only guaranteed comprehensive supply was developed in the VUK. This was used for all the construction organizations of the VDES Trust--the main consumers. But the evaluation of the progressiveness of supply by the SFA method showed that the proportion of deliveries of products to the consumers under the conditions of guaranteed comprehensive supply in the overall volume of deliveries in 1983 was 90 percent.

The work of the VUK for mobilizing surplus and unutilized resources at industrial enterprises and organizations is characterized by the level of fulfillment of the plan for decentralized procurements. Taking into account the fact that material resources can be considered to have been brought into economic circulation only when they have reached the consumer, we evaluated the quality of the fulfillment of this function by the VUK as the ratio between the volume of sales of the purchased products and the plan for decentralized purchase. In 1983 the level of enlistment of surplus and unutilized material resources into production was 120 percent. Since according to the SFA method the maximum value of each quality criterion cannot exceed 100 percent, in the report for this indicator we used only 100 percent.

The analysis of the fulfillment of the plan for decentralized procurements was augmented by an investigation of the level of utilization of materials at construction facilities of the VDES Trust and also the speed of turnover of supplies at the VUK warehouses. Using these indicators the quality of supply was not on a very high level; above-normative supplies of commodity and material values in the VDES Trust as of 1 January 1984 amounted to more than 20 million rubles, and the VUK supplies turned over less than 3 times a year. The labor productivity of VUK workers in 1983 as compared to 1981, the year preceding the introduction of the SFA in the comprehensive system of control of the quality of material and technical supply, increased by 8 percent and there was a conventional release of six people.

Another indicator of no small importance for characterizing supply is the level of mechanization of labor in loading and transportation-warehouse work, which in 1983 was 86 percent--somewhat above the average branch level. But if one takes into account that hundreds of thousands of tons of cargo go through the VUK warehouses it is not difficult to see that even an insignificant percentage of unmechanized work means tens of thousands of tons of cargo that is processed by hand.

A generalized characteristic of expenditures in supply can be obtained only with an analysis of expenditures on circulation. In order to evaluate the effectiveness of current expenditures the indicator of expenditures per ruble of sold product is used most frequently.

The actual level of outlays for circulation in the VUK in 1983 as compared to 1981 dropped by 0.32 kopecks which when translated into the annual sales volume is tantamount to saving 62,700 rubles in expenditures.

Any of the partial criteria produce only a one-sided idea of the quality of supply. Therefore the analysis was augmented with a generalization. The synthetic indicator was the integral coefficient of quality of supply obtained as the average weighted amount of partial quality criteria. The weights were selected by the experimental method for each criterion in the interval from 1 to 1.5. The greatest value of the weight was established for the indicator of promptness, completeness and comprehensiveness of supply. Additionally, in order to eliminate the equalizing influence of partial criteria from which it is possible to achieve a coefficient of quality higher than 1, in the event of the actual overfulfillment of these partial criteria their weight is taken as 1 and if they are lower than 1--the amount of the level achieved.

In keeping with the integral coefficient the following evaluations of the quality of supply were envisioned: when 1 is reached the quality of supply and sales work of the enterprises and associations for deliveries is considered to be excellent, within the range of 0.99 to 0.91--good, from 0.90 to 0.81--satisfactory, and lower than 0.80--poor. Depending on the level of quality of supply that has been reached one can arrange a system of material and moral incentives for collectives of enterprises and associations with respect to deliveries. According to the results for 1983 the level of quality of work of the VUK collective was 0.92, which can be considered good.

The determination of the ways and means of improving the quality of the work of the enterprises for deliveries is the final stage of the SFA. With all of the diversity of the problems in improving the quality of supply one cannot but note the fairly close interconnection and interdependency among them. Distributing them according to their value and degree of detailization makes it possible to construct a tree of problems for the initial one is the problem of increasing the effectiveness and improving the quality of supply and sales work of a specific enterprise (association) for delivery, and the final problem is a partial measure for improving the work of one subdivision or another.

From the results of an analysis of the activity of the VUK a four-level tree of problems was constructed which became the basis of the plan for increasing the effectiveness and improving the quality of supply. Among the most important measures of this plan one can include the following: the strengthening of the material and technical base for supply as a result of expansion and reconstruction of warehouse areas; the development of additional services for preparing products for industrial consumption, particularly the construction and introduction of a shop for cutting and gluing together linoleum; the introduction of progressive forms of organization of labor on the basis of the creation of complex brigades that work under a single

contract; improvement of the forms and methods of management on the basis of standardization of the basic functions of the VUK, and so forth.

All subdivisions of the administration participated in the implementation of the plan for increasing the effectiveness and quality of the work of the VUK. Additionally, for measures whose introduction depends on suppliers, consumers, higher organizations, transportation organizations and other organizations, agreements were reached which provide for prompt fulfillment of sections of the comprehensive plan. Control over the fulfillment of the plan was made the responsibility of a coordinating work group with the head engineer of the VUK in charge. In addition to control the main task of the group was to develop and introduce comprehensive systems of control of the quality of material and technical supply for the construction of Atomash, the Rastovskaya AES and other important facilities.

Most of the measures envisioned by the plan for increasing the effectiveness and improving the quality of the work of the VUZ were carried out in 1982. The production capacities of the shop for cutting and gluing together linoleum were assimilated, a comprehensive brigade of cargo workers working under a single contract was created with the earnings distributed according to the KTU, a large amount of manual and heavy physical labor was mechanized, and so forth. All this provided for the achievement of high final results of supply with a reduction of expenditures. The tasks and commitments for the delivery products for the construction of Atomash, the Da Rastovskaya AES and other consumers were fulfilled promptly and completely.

A considerable savings was achieved for the consumers. Just as a result of centralized cutting and gluing together of linoleum in the shop the VUK delivered to construction facilities an additional 2,500 square meters that were obtained from wastes. The losses of linoleum from defective work and other factors at the construction site were reduced by 8,000 square meters a year. The introduction of services for preparing products for industrial consumption contributed to increasing the productivity of the labor of construction workers in finishing jobs by 18 percent.

Special attention should be given to standardization of planning-distribution and production functions of the VUK within the framework of the comprehensive system. The development of standards for the enterprises was continued in 1983. Such extremely important aspects of the VUK activity as organization of guaranteed comprehensive supply, centralized delivery of products to the consumers, movement of material flows among the VUK warehouses, planning and evaluation of the quality of work of subdivisions and individual workers, material and moral incentives, the organization of socialist competition and other work was standardized.

The introduction of the first section of the comprehensive system already makes it possible to speak about the economic and social effect from the system approach to quality control in supply. As a result of stricter differentiation of functions, balance of the rights and responsibilities of the workers, and evaluation and stimulation of labor according to the final results, the reliability of material and technical supply in construction increased and losses for the construction workers because of the lack of

materials delivered by the VUK were almost eliminated. The moral and psychological climate in the collective also improved, labor turnover decreased by half and the effectiveness of socialist competition increased.

But it would be excessive optimism to say that with the introduction of the comprehensive system all of the VUK's problems were resolved and there was no longer a need for the SFA. On the contrary, it is incomparably more difficult to maintain high quality all the time than it is to achieve it just once. Therefore the SFA is not a one-time measure but an instrument for continuous control and adjustment of the system at the given level of quality. The best result is produced by this method not with episodic, but with systematic utilization, preferably no less frequently than once a quarter, during the analysis of supply and sales activity not only of the enterprise for deliveries as a whole, but also of its leading subdivisions.

FOOTNOTE

1. Marx, K. and Engels, F. "Soch." [Works], Vol 26, Part I, p 413.

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BEHAVIOR OF MOTORISTS DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 164-185

[Article by Ivan Lisitsyn (Vladivostok): "The Petkin Phenomenon"]

[Text] The road changes people's behavior in an incomprehensible way. In an ordinary situation a person is sometimes afraid to say a word. But once he gets into a railroad car he bursts into candor with his fellow travelers whom he barely knows. I recall one of these stories on the road as well.

It was wintertime and the car turned out to be half empty: the vacation season had ended and the limits on business trips from enterprises had been passed. There turned out to be three of us in the compartment: I, the Fellow Traveler--a short, puny person with an undistinguished face, and the Late One, who ran in at the last minute--a bulky brunet who was a little bit too heavy for being only 40. He angrily threw down his briefcase and ripped open his collar:

"Thank God I made it. When will there be time for everything? You read about how people are able to lead--envy takes over...."

With his immense finger he thumped on a magazine which was sticking out of his pocket:

"Here, if you please, EKO is writing about a director who has time for everything. He is both a leader and a teacher in the VUZ and he also has time for his own invention work.... I do not believe it! Do you believe it?" he suddenly asked the puny Fellow Traveler.

He shrugged his shoulders noncommittally.

"It is not a matter of whether or not I believe it, but of whether or not I personally would like to work with him. For him everything is verified and measured out. Without emotions or feelings. He is not a man but a computer. I am impressed by a different style. I can tell you about one manager if you have no objection. It is because of him that I am going to the capital...."

So, without having had a chance to introduce ourselves, we turned into conscientious listeners.

The Fellow Traveler said:

"I had not seen Petkin for about 15 years, ever since we as young construction workers, weighed down by the weight of our new diplomas departed for all corners of the country. And here was a regular all-union conference. I looked at the podium and, finally, I understood that the corpulent speaker with the crown of gray hair around his bald spot was he. I would never have recognized him from his appearance but his name which was given by the leader of the conference, a simple and unusual one, convinced me that this was my former school friend, Petkin, Grigoriy Demyanovich--GD for short. He spoke emotionally, almost without looking at the text, clearly depicting the difficulties of working in a main board with many thousands of people spread throughout a territory equal to the size of France.

As a student Petkin had never been the center of social life. His jokes caused people to yawn instead of laugh. He was considerably older than we were, he had entered the institute after the army, and he was not among the first to be admitted. It is not easy for people who have forgotten the school program to compete with evening students. But he had good recommendations from production, he was a deputy of the village soviet, and he was persistent enough. Members of the admissions committee who had become like relatives after spending three years together on leave finally gave the "green light" for Petkin to enter the VUZ in the capital. I had bits of information about his subsequent path: I knew that he had worked at various remote construction sites in the eastern part of the country and then had unexpectedly risen upward rapidly, without spending very long in the intermediate stages, and a year ago he had been appointed chief of one of the main construction boards.

I looked Petkin up during the break. Closer up GD looked fairly well: his beautifully tailored jacket covered up his excessive obesity, his eyes sparkled with the wisdom of his years and at the same time with a youthfulness which was both gloomy and untroubled. GD recognized me immediately but the conversation turned out to be shorter than I ever expected. Ironically looking over my worn suit, Petkin said:

"So, life in the capital is hard?" And it was as though we had seen each other yesterday, without any passage of time, and in the same breath he continued:

"I do not have any time now, I have to get something settled during the break. Come to my hotel this evening."

Understanding my gesture of protest he smiled in a friendly way:

"Come, do not argue, we have not seen each other for such a long time, and I do not go to visit people or to restaurants during business trips; there is no time for that."

I showed up in Petkin's room at 9 in the evening, an hour late. He quickly took from the refrigerator a sausage, some suet, some kind of fish, and took out of his briefcase a portable kettle, saying not without satisfaction: "I bring everything with me."

He poured some vodka in the glasses, sat down in the easy chair, relaxed and only then could one see how tired he had gotten during the day.

"The bureaucrats in the ministry are terrible, they have never gone farther than Kalininskiy Prospekt, to prove something--it takes endless amounts of time...."

Pity for this tired man who was no longer in his prime welled up in my heart.

"You understand," he leaned forward confidentially, "I have no deputies...."

I was taken aback since I knew that according to the distribution chart he should have had several.

"It is not a matter of distribution charts!" he answered with irritation, "the charts are filled, but there are no deputies. Whether they go to work or not it does not make any difference. I carry this load alone."

And again without any transition:

"Come and work for me, okay? I will give you an apartment, we will not be stingy with the salary, you will work as a division chief and then--we shall see.... Why are vegetating here with the old engineers?"

So I ended up in Glavsibstroy, the largest main board in the northeastern region and I worked there with Petkin for 3 years. During that time I managed to increase production volumes 1.5-fold and to achieve the highest labor productivity in the branch with the same capacities and number of personnel. I would like to talk about the years working with him, the former chief of the main board, a talented manager and my comrade, Petkin. "Former" because he is no longer in the main board. They removed him. This was obviously a mistake and a miscarriage of justice. In the court his enemies were able to prove that he was the one who gave the instruction to violate construction technology, that there are imprecisions in Petkin's report. Strange people! If only they had not done anything while receiving their wages and had just taken the blame on themselves they would have saved an important manager for the state.

"Petkin recently left for some out-of-the-way place and he will apparently never make his way out of there. After his departure his enemies, of whom there turned out to be plenty, raised their heads and took up their arms, violating the wise rule of all times--do not kick a man when he is down. This is why I am going to Moscow: for many of my classmates are in high places and perhaps they will be able to help...."

"But tell us honestly," observed the Late One, "what caused you to participate in his destiny this way: injustice? Or were you perhaps affected personally?"

The Fellow Traveler stopped short, apparently thinking about how candid he should be and, having decided, he said:

"Both. Well, who was I before this? A minor employee without a name or wages. And now I am a respected person, a specialist, and people are interested in my opinion. I have changed during this time so that I do not even recognize myself. I worked, to be sure, from dawn to dusk. Then I stopped thinking about whether my money from my wages would last until I got an advance. I live in a good apartment. My wife and children have begun to look at me in a different way! I shall be grateful to Petkin for the rest of my life."

"That is all emotions," snorted the Late One. "You have already talked about Petkin, now talk about business, about what is essential."

"Yes, yes!" the Fellow Traveler was impatient. "I came to the collective of the main board after revolutionary transformations had been made and nobody was left from the preceding management. Petkin spent 10 years teaching the staff from the bottom up and knew the value of each. Therefore on the day after he was appointed he suggested that half of the workers resign and, well, the rest of them guessed for themselves. Their replacements came from the rank-and-file engineers who had gone through the hard school of production and the majority of them had worked with Petkin and knew him personally. This took place a year before I came to the main board but I knew almost everything there was to know about what happened."

"GD himself helped a great deal. Because of the generosity of his nature he was not able to hide his experience from others and he revealed his educational nature in simple, easy-to-understand examples. We received the majority of the lessons from his own production life. His life's path, from being a worker to being the chief of the main board, was not, as they say, strewn with roses, and there were many examples to show this. His memory would seize with satisfaction first one fragment and then another from his own biography regarding the subject of the conversation or the situation that had arisen. The science of management had placed many visible images before us. Most frequently this took place in an improvised way, but sometimes Petkin would warn us beforehand of a forthcoming educational moment:

"Tomorrow I shall call you together and show you your stupidity...."

"Well, he is a boor, your Petkin!" the Late One was surprised.

"No, he just said that to be witty. And everyone understood this and they were not offended. He sometimes praised people, but it was usually the middle level. GD was true to the principle: if they deserve it give them praise, if they have done something wrong give them what they deserve. The person who most frequently figured in the role of a model was the chief of the equipment division of Glavsibstroy, a certain Smirnov, a middle-aged man but one who looked youthful. He would react in a minute to any technical malfunctions. It was almost as though he had an airline ticket already in his pocket. For this GD used him as an example for others. But once there was an accident at

one of the enterprises, the division was indirectly to blame for it, and the direct blame fell on the enterprise's engineering service. Smirnov was on vacation. When analyzing the accident at a conference Petkin said:

"Tell that idler that he should have come back from vacation! Let him look for another job!"

"Petkin repeated these same words in various variations at conferences a couple of times more, apparently in order to reinforce the educational effect so that everyone understood completely that the respect and authority of each is directly dependent on their work and that there can be no special treatment for anyone.

"Incidentally, when Smirnov came back from vacation everything stopped and was as it was before: he was strict, but fair, our GD.

"Petkin taught the staff workers not to bury themselves in papers and not to break their ties with production.

"After seeing the dispatcher do not go back to your office,' he told one division chief, 'go immediately to the plant. I am going to tell the janitor not to give you the key to your office any more.'

"Or:

"Look at what a smooth one you are: nothing will get you down. In the trust offices they all ask when you are coming and you sit at home getting fat.'

"He once had a deputy for supply who thought that he was the favorite or at least one who would be promoted. But I recall how at a dispatcher's meeting GD cut the favorite short:

"Don't behave like an idiot: you are studying supply from the larger perspective. You are making do with a smattering of this and that!"

"The supply worker loved to show the logic of his actions. One day GD pinned him to the wall with facts. He had nothing left but to refer to a decision of the conference:

"The board decided....'

"Not the board, but your stupidity!"

"GD said to the head energy engineer who objected that he would not do something:

"You can decide what you will and will not do at home, but here, for your wages, you will do everything you are told to do. And you need to keep your mouth shut more of the time!"

"Once, having returned from a business trip, GD said sadly:

"I traveled through the entire area. I got the impression from our economy that we had spent our whole lives raising calves, and now suddenly they have thrown us into energy construction...."

"Once GD made a remark to a touchy young man who was the deputy for personnel; the latter answered sharply and...things took their course.

"I am telling you seriously," yelled the deputy, already red. 'Stop these public insults!'

"And I am telling you in front of everybody," Petkin answered quite calmly, 'that it is necessary to work seriously and not get huffy.' He also chewed out the deputy for economics because of his uncontrollable love of instructions:

"You sit here and read books about scientific communism and in the taiga the people are hard at work!'

"Or:

"You are a good planner but a terrible manager: you cannot see beyond your own instructions. Soon we will drive our directors away with your instructions...'

"He did not miss any of the deputies, but he did not especially pick on them, except for Kortsev (I shall tell more about him later). Everyone got theirs in a sequence that was known only to GD. To be sure, sometimes everybody got it at once:

"You see how I came back from Moscow?! I am tired of pleasing the big wheels for all of you! You are not responsible for anything! No, starting today, everything is going to be different!'

"The division chiefs sometimes got in trouble too, but less frequently. He did not get down to the rank-and-file engineers.

"Probably Petkin deliberately created microconflicts, being firmly convinced that in a situation of general calm, without work stresses or constant tension and, perhaps, even without fear there could not be proper effectiveness in management. But judging from several of the things he said he was still unable to overcome his antipathy for the management staff as a whole, something which had developed during the years when he was vegetating even though nobody was left from the previous staff. Sometimes he would declare openly that there were nothing but idlers on the staff.

"None of you overwork yourselves. You work according to the time clock. You do not even earn your two weeks' vacation,' he said once. 'If one of you does not like this or your nerves cannot stand it, tell me and I will find a replacement.'

"Petkin always presented his conclusions calmly, without being nervous or making any fuss, and he rarely lost control. Only once did he blow up: when

the manager of the Pykhtinskiy Trust became seriously and had to be replaced. Petkin asked at a dispatchers' conference if there was anybody who wanted this position. The answer was a frightened silence. And he was silent too. Then he asked ominously:

"What, nobody wants to tear their ass away from the main board?' and suddenly he began to yell: 'Well? Who will go to the trust? I will add to the salary of the manager a 100-ruble increment, a four-room apartment, and a medal at the end of the five-year plan: it will kill me but I will do it. Well?'

"But he did not hold a grudge, our GD: he could be yelling at 10 in the morning, even insulting people, and by noon he would be listening attentively and speaking sympathetically.

"A deputy had to experience and live through most of all when it came to capital construction. Kortsev himself did not have a sweet disposition and he was stubborn--you could not move him. He loved to demonstrate his opinion: 'I think this...I think that...you are wrong here, Grigoriy Demyanovich....'

"What boss likes it when his opinion comes second to someone else's? And in such a calm, indifferent tone? He pauses, he thinks, and then he speaks somehow dispassionately, as if he were a witness observing from the sideline. And this does not pertain to him. The tone itself caused GD to lose control.

"You, Kortsev, say everything in a whisper, and you make your promises in a whisper, and then you do nothing!

"But the relations between them is a special subject, and here GD was not on the highest level, but more about that later.

"A directness of judgments and relations was typical of Petkin. He did not conceal his sympathies and antipathies either from the higher-ups or from those under him, but he especially disliked people who were lazy and negligent. He could point with his finger:

"He has gotten so fat that he has no time for production!

"Or:

"What would happen if I were as lazy as you are! The main board would fall apart. They would send you out into the tundra!

"With people who talked all the time and did nothing he was simply merciless.

"You go home and make promises to your wife,' he once interrupted someone who liked easy talk, 'but here you had better work!'

"Or:

"You had better get busy and stop trying to hide in the corners....'

"One of the indicators of the work output of the subordinates and the degree of their participation in production for Petkin was their information about the work being conducted. If a person had not come to see GD for a week and had not reported anything new or consulted him this caused him to take notice, within 2 weeks he was looking on suspiciously and within a month he was convinced that the person was not doing anything. If a person on a business trip had not called him once or reported on what he had done, he was threatened with a strong dressing-down. But Petkin was also able to see the subtext under a cheerful report.

"You report smartly, like on a parade ground.... This is good. But pay attention to the fact that the foremen are complaining about you. And this means that your report contains more for appearances than it does real work, understand? The foremen are waiting for decisions and it is not because they have anything against you.'

"The degree to which Petkin was informed both in production matters and in the personal life of everyone was simply stupefying. Incidentally, while knowing each person through and through, his merits and especially his shortcomings, Petkin was not stingy with praise. While allowing himself to say a kind word about someone, GD did not like it at all when others did this. If they praised one of his subordinates he even got in a bad mood.

"The Pykhtinskiy Trust operated well for several years. It was led by the young, energetic Miroshnichenko, who had taken over from Petkin. And one must say that after Petkin left the trust things went better. When he saw the regular publication about Miroshnichenko and the trust GD simply lost control:

"They have made the guy look good, he looks brilliant!"

"Or:

"What did they have to pay the newspaper so that it would write only about them?!"

"It seems that GD was no less jealous of those workers of the main board who were able to handle certain issues better than he could. Petkin was especially demanding of these people."

"Your Petkin reminds me of an artist," the Late One raised his finger, "whose favorite role is important to him not for its own sake but as a means of self-assertion...."

The Fellow Traveler shrugged his shoulders:

"Somehow that never entered my mind. And even if it were so, what is wrong with that? Let him assert himself as long as the work does not suffer. But Petkin was a great fighter against any kinds of shortcomings in the organization of production. One was impressed, for example, by his hatred for any kind of bureaucracy."

"Take it easy on the paperwork,' he repeated more than once, 'look at the taiga--nothing is left there, and you are still writing and writing. I will not sign such garbage!'

"Or:

"Keep the documents for yourself as souvenirs. As soon as they send a report or a document to me from the staff I immediately return them to the authors with a note: 'For action.'"

"When he received the next set of instructions GD would not hide his irritation:

"There are no blizzards on Kalininskiy Prospekt. It is difficult to prove to them that they exist here!..."

"GD found it difficult to sign papers, he experienced some kind of torment and hostility, he kept them in his desk drawers for a long time, shuffled them around and then sent them back again, returning them for completion or with the notes: 'Decide on the telephone,' 'Formal reply not necessary,' 'Superfluous,' and so forth. His instructions about processing documents were unusually laconic: in the form of question marks, exclamation points and interjections.

"One impatient person, without waiting for the return of the papers that had been sent for his signature, went to the secretary and got them back and sent them to a deputy for a signature. This sometimes turned out to be very unpleasant for the latter. GD did not like it when important letters went through without his knowledge.

"To be sure, there were periods when Petkin would sign all the materials presented to him almost without looking at them. News of this would spread quickly and everyone who had been waiting for that day would go to take advantage of it: GD would almost never return to a document once it had been rejected.

"Petkin's impatience denied the customary procedural canons and sometimes he would give instructions directly to a rank-and-file staff engineer and sometimes to the foremen of a production section, thus cutting down the ladder of movement of an order by several rungs. Then he would tell the person who raised the issue:

"This issue has been resolved with your subordinates. Go consult with them.'

"But in the existing system of management which is constructed around the need for complete control, this device was apparently premature and the appropriate conditions for executive discipline had not yet been created. This led to conflicts.

"Petkin was distinguished by his outstanding boldness in making decisions. Thus the chief of the financial division of the main board was an extreme pedant who always wanted to play it safe. His name became an everyday word:

at all of the conferences, meetings and gatherings it was used as a synonym for utter bureaucratism. If somewhere something had been slowed up and bogged down in red tape everyone knew where to look for the source: in the financial division. The chief of the financial division, for example, managed to convince everyone that the fund for social, cultural and domestic measures could not be used for trips by children of workers of the main board. Even the local committee agreed. But one time a group of workers from the equipment division, no longer willing to put up with this long-standing prohibition, got past the secretary and burst into GD's office. He signed the account for the passes and not just anywhere, but to Moscow for the New Year's Eve celebration, and not just for one or two, but for 11 people! The division was full of joy for the entire year! To be sure, the others who were not so lucky were twice as offended, and the chief of the financial division began to fight even harder. Another time GD in the same way signed an account for the young fliers' club which had nothing to do with the main board for 17,000 rubles when its leader had already despaired of reaching a decision. There were stories like this pertaining to personal increments to salaries and many other things as well. All one needed to do was to find the right moment when Petkin was disposed to take such steps.

"The main forms of management in the main board were the DPS's--dispatcher production conferences: small DPS's conducted in the office of the chief of the main board with staff workers from 10 in the morning until 12 or 1, depending on the range of issues being discussed and GD's mood, and also large DPS's which took place on Mondays in the meeting hall of the main board with managers of city enterprises and subdivisions of Glavsibstroy, GD's deputies and the chiefs of staff divisions from 2 in the afternoon until all of the issues had been resolved, sometimes midnight. Monday was a truly difficult day in the main board: in conferences until 12 am!...

"The large DPS was the weekly time for GD to shine, to show his brilliant talent, his phenomenal memory and his quick wit. When Petkin was not there the DPS's were conducted by his deputies but not one of them could compare to GD. Everything was colorless and ordinary, without enthusiasm or a sense of celebration. It is precisely by means of comparison that one can see how exceptional Petkin was: nobody could distribute automotive transportation and construction materials so quickly, eloquently and, the main thing, objectively, nobody could parry so sharply and wittily the offensive in attacks from people who were dissatisfied with the decision. If the manager of a trust has said, for example, that he does not have enough people, or that the plan has been raised for him, or that he has not been assigned either production capacities or resources, GD would immediately, without thinking for even a second, bring to mind the names and the quantity of components, parts and kinds of equipment that were gathering dust in the warehouses of the trust and he would correctly reproduce the statistics of the trust's production indicators for the past 5 years from memory. At those times it was not Petkin, but a knight breathing justified anger. It became quite obvious to everyone in attendance that the opponent did not know his own reserves.

"True, I suspected that Petkin prepared in advance for his brilliant extemporaneous talks at the DPS. Sometimes the event would take place at the beginning or in the middle of the week and he had met with the guilty party

several times, had every opportunity to clarify the circumstances but put it off until there was a large DPS in order to take advantage of the maximum educational effect.

"A no less important form of operational control over production were the daily morning talks with the enterprises by telephone. On the weekdays these were conducted by Kortsev, and on Saturday--by GD personally. At exactly 9 in the morning his deputies and division chiefs of the staff sat down decorously at the conference table and the long-distance operator called managers of enterprises in other cities in turn, and their reports, over the loudspeaker, were heard clearly by everyone and entered into journals which were issued especially for these purposes. Without hurrying they conducted the weekly analysis of the work of the enterprise, clarified the reasons why it had fallen behind the plan if this had happened, and the manager received responses to all the questions he had raised. Petkin frequently used this form of communication for educating managers as well.

"Merishnichenko, I am going to write an order to you--you are not engaging in production. We have people on our staff like that too. They are calm. They do not rush forward. Residents of the settlement no longer believe my promises or yours...."

"Come and work here in the eternal frost! You will learn!" The other person bursts in.

"So! I made him mad. Maybe this will work?" GD addresses those in attendance, satisfied with the effect.

"Petkin loved to comment in between the long-distance phone calls:

"Merishnichenko confuses his own products with cement. And he graduated from an economics institute...."

"And another time about the same person:

"This is our regular mistake. A God-forsaken person. He has great value--a group of spare parts in supply. For 15 years he has been getting on people's nerves, and he will not die and he will not leave...."

"And you like this boor?" the Late One interjected.

"Yes, that is all talk and nothing more. Do you think that he really wished death to somebody? This is only a form, perhaps not the most successful, but why should he conceal his sympathies and antipathies? Everything should be crystal clear in relations, and Petkin hides nothing. And GD's basic activity compensates for all this trivia."

"Petkin considered a faultless knowledge of the operational situation and the ability to control and regulate it to be the reason for the success of the main board in recent years.

"Plus the problem of certain of our chiefs,' he said repeatedly, 'is that they do not pay enough attention to "trivia."'

"GD could not forgive ignorance of the operational situation. One could forget control figures for the five-year plan but not to know, for example, how many days' worth of materials were left at the Pykhtinskiy Trust or why the brigade leader Larianova had not fulfilled the daily norm was considered to be a crime for each staff worker or at least a serious blunder in work.

"What are you asking?' he would yell at the guilty parties in cases like this. 'You will not decide anything anyway! You do not have the necessary information!'

"When people tried to suggest that GD discuss some long-term issue he refused politely but firmly:

"Do you think I want to handle these problems? Sit and think in the quiet of my office? But we have barracks all around us! It is necessary to build and build! And all of our forces are only for this. And that is all we need to do now. And not go looking for things to do. Everything else is the business of science.'

"One cannot say that Petkin did not want to deal with the future at all. He actually did not have time for everything and the range of his duties did not allow him to take a breather and look around. Once Kortsev introduced the figures from a time and motion study: the average length of the working day was more than 11 hours and 70 percent of these were taken up with conferences, almost all of which were conducted on Petkin's initiative. But if some free time suddenly appeared GD would immediately begin to solve long-range problems. His active nature would not tolerate inactivity: within a moment or two secretaries and delivery boys were scurrying through the corridors, the telephones were ringing in the divisions and there would be an immediate conference on capital repair of equipment, general questions of supply, or informing the enterprises of planning indicators. But the problem was that neither the head engineer nor his deputy for supply and economics were to be found: but even without them GD would set the limits for repair and solve problems related to supply and planning. That was why he was chief of the main board--so that he could take care of everything!

"To be quite honest not everyone liked this; there were those who were dissatisfied."

"When will all this bacchanalia end?' The deputy for supply was disturbed after such a spate of conferences. 'I have a staff (100 people!) working on this job and he makes the decisions by himself. And then we have to give explanations and get ourselves out of the mess. I am going to submit a complaint to the party bureau about his style of management--let them deal with him!'

"Kortsev supported him:

"The DPS is a KVN: in 4 hours 100 questions and 100 answers. Many of them fall within the range of competence of rank-and-file engineers. Everything should be put in its proper place and resolved in a businesslike way.'

"But, of course, nothing went beyond being a threat. Style is not very important if the main board is confidently fulfilling the plan for the first time in many years. But yet what was the Petkin phenomenon: things got done with him, and fairly well! Everyone understood that Petkin was always behind schedule and that he never thought about anything but work. Conversations about movies, not to mention the theater, made him confused: How can one waste time anywhere when there are so many unsolved problems?

"I also go to the movies when I am on business trips,' he once declared. That was all.

"Once I saw him irritably throw away a magazine article that had been brought to him:

"I do not have time to read newspapers!'

"Petkin never went to visit anyone and he never invited anyone to his house, and he had not seen his relatives for years.

"GD is not a simple person, there is something contradictory in him, but what saves him is his boundless devotion to work.

"I am a peasant tool' he once shouted at a head engineer who had asked for a Saturday off to go hunting. 'And I like to shoot ducks and chase after rabbits! But my rifle has already become rusty!'

"So what should we do, spend the night in our offices as we once did?' the person with whom he was speaking replied.

"And that was a good time! There were fewer idlers. But now...shooting rabbits!'

"Petkin did not forget about work even when he was on vacation: each day they would telegraph to him at his vacation spot the basic indicators of the work of the main board. And he went on vacation purely as a formality: for a week or maybe two at best. As a rule, the minute he left the indicators began to fall and they would call him back. But not long before the beginning of this story I am telling GD left on a tour of Italy. Something had gone wrong abroad and he returned. Things were going well in the main board and nobody had called him back. Each day GD would come to work, toil away, go through the divisions, talk about trivial things with the managers, and everything got better and better with the plan. During the more than a month of GD's absence at work early fulfillment of the plan became almost a monthly program. Petkin came to work in a bad mood and raised such a fuss at the first DPS that the people with weak nerves were taking Valium for a week afterwards. GD did not like it when something turned out well without his participation.

"Petkin had an especially painful experience with the plan. If the month came out well he would personally call and report to the minister. If the minister was not in, then to one of his deputies, and if there was no deputy nearby he would read the minister's secretary all of the indicators and ask her to tell the minister that Petkin had called. But if the plan 'failed,' then GD would irritably push the task off onto the planners:

"'Convey our shame!...'

"For Petkin the plan was not simply the law but the point of his entire life. It seemed that his organism was regulated not by an biorhythms, but by the lifeless columns of the daily summaries: his working tone, the way he felt, his mood--everything depended on them. Any attempts to cast any doubt on the feasibility of the fulfillment of the plan were immediately swept aside.

"'We must work and not look for excuses and justifications,' he interrupted Kortsev when he was trying to prove that the plan was not balanced. 'A master of explanations is rarely a master of anything else....'

"But the holy of holies--the plan--Petkin could not help but use for educational purposes: he could present the plan a little more simply to those managers of subdivisions of the main board who were disciplined and just as self-sacrificing as he was. And for objective planning he did not require a complicated mathematical apparatus: even without this he had a clear idea of the possibilities of everyone. Therefore Petkin did not need an ASU, and they did not stand very high in his esteem. During the time of GD's rule the ASU divisions were cut in half. And machine information did not notify Petkin of the underlying cause of each figure.

"The condition of discipline was a subject of special concern and worry for GD.

"'If you have not learned to carry out the commands given here,' he said at a DPS, 'then we will have to get rid of you.' At the same time GD could not tolerate workers who came to work and left right on time. He considered them to be potential idlers. He had a real aversion for people who did not come in on Saturday at least for an hour. To the chief of the batching division, a person he had respected up until he failed to come in on a Saturday, GD announced at a large DPS:

"'And I shall say to you in front of everybody that you are a rotten apple among the division chiefs!'

"Not understanding the interests of others except for work, Petkin expected from others the same kind of self-sacrifice and denial of everything but work.

"'I arrived at the office at 5:10 pm and there was nobody there!' GD shared his impressions from a trip he took to the Pykhtinskiy Trust. 'You came too late, boss,' said the guard. 'After 5 sharp you cannot leave--Auntie Masha will lock you in the office. And look at Miroshnichenko's bald spot, how tan it is. He manages to do everything. They all have dachas and gardens. And

for this he was given a medal--I cannot figure it out....' Incidentally, Petkin was truly happy about the medal that was awarded to Miroshnichenko.

"Or:

"There is some berry and mushroom epidemic: I called several managers on Sunday and there was no answer. They had all left. If you go gathering mushrooms on Sunday you lose your grip on the management and then you are surprised.'

"GD devoted quite a bit of attention to the selection of personnel. The immense burden of the main board, he thought, can be carried only by health, physically strong people. Incidentally, many eminent managers lean toward this opinion, considering good health to be one of the main qualities of a good administrator. The illnesses of the staff workers alarmed Petkin, and prolonged illnesses bothered him seriously. The cause which he selflessly served and for which he was responsible forced him to take strict but necessary steps.

"When I become ill they will fire me from the position I hold. I had a heart attack of the third degree and I was registered in the hospital, but I worked. But you,' said GD once to Smirnov, 'there is nothing wrong with you at all and you lie around in bed.'

"When Miroshnichenko was in the hospital after the construction of the complex Petkin said categorically:

"Now everything is clear with him: I must look for a replacement. A director must be healthy as a bull.'

"In placing personnel Petkin was oriented toward local labor resources; he could not stand 'strangers.'

"I will not accept anybody from the outside. Until they are assimilated and get into the swing of things.... In Pykhta I know where every board lies, how the nails were pounded.... One must be born here in order to have this kind of idea of it. Put us in another oblast and we would be little kittens, literally little kittens....'

"With workers who did not meet the responsibilities GD carried out a precise policy. Once he had selected a staff he did not stop with what had been achieved and continued to improve it, but he did not fire anyone on the initiative of the administration. For a worker who was not very good GD created conditions so that the worker submitted his resignation 'at his own request' and at the same time he selected for him a good place, sometimes with higher pay, in the system of the main board or at enterprises of the city. Some of those who were "redistributed" got their stride in the new places and were subsequently in good standing. For others this was a stage in the movement around the large circle.

"GD categorically put a stop to any attempts to fire anybody 'because of unsuitability':

"What are you talking about?!" he said. 'In 3 years I have not fired a single person.'

"In order to increase the effectiveness of engineering labor and to educate the managers Petkin practiced moving specialists along the horizontal, apparently following foreign experience. In order somehow to quicken the creative thinking of the rest of the workers and to shake them up Petkin periodically transferred divisions from one set of offices to another. He did this in Pykhta as well, but he was especially hard on the staff of the main board: some of them during the time they work for him Petkin moved to five different work positions.

"Unfortunately, not everyone understood his selection of personnel.

"Petkin always said, both in front of his deputies and when they were not there, that he had no deputies. Various people had often said: 'Why talk to the deputies? If you go, go straight to Petkin.' GD frequently overrode the orders of the deputies. This happened most frequently at the DPS or in talks. The public nature of the procedure had an educational effect also on the indirect participants in the decision, the coauthors and the witnesses, and it made them think about their decisions more and take all circumstances into account from then on.

"I will not be able to do all this in a day,' Petkin once complained to the secretary of the gorkom, 'I must do everything myself, by myself. I have at least 10 deputies and there is nobody to give instructions to. You take 15 minutes to explain to a deputy what to do and how and then he takes a half hour to tell the division chief and then he, going along the chain, must tell his deputy.... By the time it reaches the engineer who is supposed to do the work everything is mixed up like a "malfunctioning telephone." And all the deadlines will pass before it actually gets done. It is simpler for me to work directly with the people who will do the work, I think I will cut the number of my deputies in half...."

"Well, if the deputies are bad," the Late One interrupted the speaker, "then one should feel sorry for Petkin, sympathize with him and not scold or punish him for omissions. But generally this is a convenient position: poor assistants cannot do anything useful and therefore the successes are unquestionably to the credit of the manager. I think that your Petkin simply does not need good deputies and they should take him away from his. Is this not so?"

"It is difficult to agree with," answered the Fellow Traveler, having thought about it, "but some inexplicable disagreement between GD and the deputies would occur: the better the deputy delved into the matter, the more intelligently he began to solve the problems, the worse it was for him in the end. As long as he was working poorly, the matter was limited to ironic remarks. The more skillful he became, the fewer mistakes he made, the more independently he made decisions, the worse GD dealt with him, right down to offending him in public. This is what happened with the deputy for personnel, the deputy for supply and this is also what happened with Kortsev.

"Kortsev came to the main board a year before Petkin did from one of the enterprises of the region. He did not come because of his good will; they almost had to use force to get him there: for a long time this difficult position had gone empty; it was a bad position where no one lasted for very long. He adjusted quickly, worked efficiently and delved into the production scrupulously. He knew the operational situation and he worked for the future. He was not savored by destiny. Like GD he had gone through all the levels, beginning as a worker. With Kortsev when he replaced Petkin during vacations and business trips everybody felt calm and confident, not small and helpless as they did with GD. During the first year GD did not expect anything from Kortsev, but then he changed unnoticeably. It began with trivial things which it is unpleasant even to remember. For example, on one of his first days in his post GD introduced an efficiency proposal in correspondence: for incoming and outgoing documentation he adapted a photographic developing tray--it was convenient because the papers did not fly all over the desk. He suggested that others follow his example. But Kortsev took it and made a joke:

"'I do not have an enlarger yet.'

"GD did not say anything, he just became gloomy but he looked around in such a way that everyone understood--a reminder was left in his memory. (Incidentally the developing trays later made their way into use and many people borrowed this idea.)

"One time GD saw (and he loved to walk through the offices) that Kortsev like many others in the main board was drinking tea during work. When the right occasion came he said:

"'You sit here and drink tea while others sit for days without moving.'

"'Sitting here until late night is not heroism, but a sign of unintelligent management,' Kortsev parried.

"'But I have to make up for your omissions!'

"'You worry about us, but do not do your own work,' Kortsev got in the last word and left.

"The subject of tea subsequently figured for a long time in the work conversations.

"'I do not live at your tempo. I do not have time to drink tea!'

"Or:

"'Our Kortsev is a prime minister. A smooth empty desk without a single paper, only a cup of tea. If I had worked this way the main board would have fallen apart...'

"A major disagreement, after which their relations deteriorated appreciably, took place after this instance. In order to keep track of the administration

24 hours a day, GD suggested creating a dispatcher point in the staff. Kortsev resisted this innovation more strongly than the others:

"We have 400 dispatchers already.... With all of Petkin's dislike for office workers the staff of the main board increased during the time he was working there from 100 to 400, why do we want any more?"

"You cannot see beyond your own nose," thundered Petkin. "You always leave and sleep peacefully and whenever there is any emergency they wake me up in the middle of the night with phone calls!"

"After that the conflict developed more rapidly and shifted to the stage of the small and large theaters (this is what the jokers call the DPS's).

"Your horizons are at the level of a technologist," said GD. "You are not a deputy chief of the main board...."

"That's right," agreed Kortsev, "I am a deputy head dispatcher" (with a wave of the hand Kortsev attached to GD the title of head dispatcher, for which Petkin could not forgive him until his last days.

"You're in love with your divisions," GD moved on to an official address, "and you see nothing beyond that."

"And you are in love with yourself," Kortsev answered impatiently. "You play the role but you do not work. You do not want to work but to attract attention to yourself."

"Kortsev's painful passion was his desire to have the last word, to make a wisecrack on any occasion. This not only worsened his relations with GD, but also led to disagreements with his colleagues who held equal positions. Whenever he could GD responded in kind.

"These mechanics, well, what do they understand about production?" he said in one situation in which nobody had any doubt about which mechanics he was talking about.

"GD transferred this hostility to the divisions supervised by Kortsev as well. There were more frequent monologues with hints and semihints, and criticism that was not proportional to the mistakes and omissions became stronger.

"This estimate division is some kind of black hole. Information goes in one direction, out there. It never returns. And what do they do with themselves besides drink tea?"

"But Kortsev tried to take the blows on himself. Even before he had never allowed people to say anything bad about his divisions. The letters and orders which were to be carried out by several divisions Kortsev inevitably transferred to other, 'outside' workers. Kortsev's divisions were the largest and they never managed to convince him to eliminate anybody, although this could have been done without harm. I was well aware of this--Kortsev was also the supervisor for my estimate division. But he was able to organize work

with a high return. There was never any doubt about Kortsev's personal credit for the successes of the main board. This also apparently irritated Petkin.

"Kortsev had a flair for new technical equipment and technology. Several suggestions which seemed doubtful he accepted at first glance and actively introduced them. Then they ended up in thousands of rubles' worth of profit. Other inventions which had been tested and proved themselves he held back and responded to questions with skillful formal replies. Suddenly it would turn out that the biggest innovation was nothing more than a passing fancy. Kortsev was valued for this quality both in the main board and in the ministry. In spite of all this many people did not like his manner of conducting business conversations or his desire always to have the last word in an argument. Kortsev was not able to hold himself back and sometimes he would lose control of what he was saying. He once told Petkin that he was a moral sadist, that in order to work normally he needed to degrade and insult somebody just as a morphine addict needed his daily needle, that GD felt a mistrust of all people, of mankind and that the feeling of his service career which GD had incomprehensibly surpassed was night director....

"Petkin, of course, did not let this pass: he kept score for insults both large and small. For one reason or another there were more and more commissions to investigate Kortsev's problems. This ended with several reprimands for him. Then the people's control committee took an interest in him: several times they called Kortsev in and as a result of this he lost 2 months' salary.

"But for the totality of positions they had mastered the group of workers of the main board, including Kortsev, were given large bonuses for new technical equipment. GD kept the telegram, made a call to Moscow, crossed off Kortsev's name, retyped the text himself and turned it into the bookkeeping office for payment. And a couple of days later an announcement came from the ministry to Petkin: 'At your oral request we are permitting you not to pay a bonus to Kortsev.' The content of the telegram became public property....

"What kind of work could take place in such a situation. There was a large scandal in the air. Glavsibstroy was divided into three camps with uneven numbers--followers of the two hostile parties and a group of neutrals. More and more time and effort was spent on searching for evidence that compromised the other side and justified their own actions. The growth rate of production for which the main board was famous began to decline and the victory march came to a halt in the fourth year of GD's rule: they fulfilled the plan for the first quarter with difficulty, they failed for the half-year, they pulled out the 9-month plan, and the fourth quarter, according to calculations, they obviously and frankly were 'hovering.' The Pykhtinskiy Trust could have come to the rescue and saved the situation. It had everything necessary for the construction of a complex for fattening cattle: timber, brick, cement, reinforced concrete, metal, slate and equipment. They had people and time and a standard plan for the complex. They were lacking only one small detail--the planning institute had not managed to reach the plan by the deadline.

"'It must be constructed!' announced Petkin in the next discussion.

"Without attachment of the plan?' objected Kortsev.

"Since there is no other way out.'

"You will not have my consent.'

"For a week GD exhorted his deputy, persuaded him, convinced him, threatened him--but Kortsev would not yield.

"I have three deputies,' hissed Petkin, his voice shaking with hatred, 'for whom the worst things are for the main board the more joyfully they rub their hands together: "That is bad for him, Petkin." Women have even come to me in indignation: "How can they behave that way?!"'

"After a week's battle GD put the question point-blank: either Kortsev gives his consent and goes to be in charge of the construction project or he turns in his resignation. This conversation was on Friday and on Monday Kortsev brought in his resignation.

"Miroshnichenko, of course, was not enthusiastic about this construction; he had a good idea of the possible consequences. The more so since he had fulfilled his annual plan without this. He took his objections to Kortsev.

"On Monday on the intercom GD asked:

"How are things at the complex?'

"They have not started. We have a telegram from Kortsev--without attachment he will not construct it.'

"What? This is the fifth column that is working against me! Kortsev no longer means anything in the main board! Begin the construction immediately!

"The head energy went to be in charge of the construction project. People and equipment were sent from all the enterprises of the kray to assist the trust. In 2 months they have done the impossible--in December they turn the complex over to the state commission. But in April when the spring rains came and the washouts began the complex began to disintegrate before their eyes, to settle and crack."

"God will get the scoundrels," the Late One said barely audibly. "If not this time then some other time...."

"Petkin always took the difficult matters on himself," the Fellow Traveler continued, disapproving nodding his head to the reply, "and therefore he went himself to take charge of the emergency and again displayed his extraordinary talent as an organizer. People in technical equipment were gathered again. In conjunction with the planning institute this time they patched the entire complex, placed reinforced concrete palates under the structure, and saved the animals and the reputation of the main board. GD returned a little the worse for wear but triumphant. He wrote everything off to the elements: the unusually snowy winter and the rapid thawing of the snow in the spring. But

this explanation did not satisfy the ministry, and the losses were too great. the procurator took an interest in this matter. The investigator quickly proved that the construction had been carried out with gross violations of the norms and rules. Then GD began to say that he did not know about the lack of the attachment for the plan and thought that everything was in order. He could not check on everything himself. He did have deputies! And he had not given any written instructions. But the Saturday conversations with 2 dozen witnesses turned into a trap for GD: everyone in attendance testified that Petkin had given this order to Miroschnichenko, and GD went from being a witness to the accused.

"This actually is the entire history of the rise, flourishing and premature decline of an extraordinary personality. Petkin left. Things became empty and colorless in the main board. Instead of the noise of somewhat walking impatiently through the corridors, on the desks are heaps of unsorted papers. The urns in the stairwells accumulate cigarette butts twice as quickly. Something has invisibly changed, communications with production are worse, the conferences without any content lasting for many hours have become more frequent, and the flow of complaints and letters has increased. Indicators of the main board are inexorably sliding downward. People are already saying: 'Should we not bring Petkin back? He was at least capable of defending state interests. He was not always good and not in everything, but he evoked respect through his devotion to duty to the end, without thinking about himself. A most experienced builder and an organizer with initiative, I have no doubt that GD has plenty of work. But did they have to deal so harshly with him for one mistake?..."

"Yes, a curious story," said the Late One, turning toward the window. And, after a silence, he added: "We all have a little bit of Petkin in us. At least I can see that in myself. Not long ago I conducted a conference and behaved exactly as your hero did. And I was glad that something was accomplished."

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EMOTIONAL ASPECTS OF WORD PERFORMANCE DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 186-192

[Article by I. Ye. Shvarts, doctor of pedagogical sciences, head of the personnel education department of the Perm Pedagogical Institute: "Autogenic Training in Production"]

[Text] It is well-known that a person's ability to work depends on his mood. This means that having augmented the arsenal of means of management with the psychological condition, in the final analysis we will be able to influence labor productivity more effectively. One of these means is autogenic training (AT). It is a system of devices for psychological self-influence with which it is possible to adjust the internal condition of the organism. Reflecting the essence of autogenic training, it is fairly frequently called a means of psychological self-regulation. Autogenic training, which originated in medical laboratories, became widely used not only as a therapeutic means, but also as a technique for personal work. It is used in various spheres of activity--sports, the theater, pedagogy.

The collective of the education department of the Perm Pedagogical Institute for the past 10 years have been conducting a series of research projects as a result of which they revealed the possibilities of applying the method of psychological self-regulation for solving certain dietetic, educational and psychological problems under the conditions of therapeutic-educational institutions. The results that were received of the experience that has been accumulated made it possible to transfer the application of autogenic training to production conditions.

Physical overloading and the monotony of assembly line production cause psychological discomfort in the human being and a condition of depression and uneasiness appears. Among the various methods of influencing the mood of the workers autogenic training, unfortunately, has not taken its proper place. The methods and fundamentals of its organization have not yet been sufficiently developed.

Brief information about the application of autogenic training as a method of production hygiene is contained in the book by S. G. Belyayev, V. S. Lobzin, and I. A. Kopylova, "Psychological Self-Regulation" (Leningrad, 1984). But

unfortunately the authors, while noting the positive effect of the method, do not reveal the system for its introduction into production practice.

Approaching the problem of optimizing the psychological condition of the workers with the help of autogenic training we proceeded from the three following assumptions: first, autogenic training makes it possible to control the emotional condition of the workers; second, it is possible to have an efficient method of psychological self-regulation under the conditions of production and, third, autogenic training will not only contribute to optimizing the psychological condition of the workers, but will also produce an economic effect.

Research has been conducted by workers of the pedagogical institute, A. A. Dubrov, B. M. Charnyy and the author of this article, at the Perm Electrical Equipment Plant (1979 and 1980), the Perm Goznak Factory (1981) and the Nytvenskiy Metallurgical Plant (1982 and 1983). The results make it possible to assert that almost all the workers, regardless of their skills or psychological condition, can master autogenic training if they wish to. But this is not the end of the problems related to the application of the method.

In the first place, how are the classes organized? If when mastering the technique of autogenic training the composition of the students is not significant, subsequently, in the stage of the psychological sessions, it is necessary to create specialized groups. To compose them it is necessary to do research which makes it possible, if only generally, to judge the activity, the attitude toward the environment and the psychological condition of the workers.

Production workers with approximately the same deviations in psychological condition (increased anxiety, depression and so forth) are joined together into profile groups. Classes are conducted in these groups every other day for 1 or 2 months during work breaks or before the beginning of the shift, and sometimes after work as well. Each class lasts up to 30 minutes. As the technique of autogenic training is mastered the time of the session decreases. The cycle of classes is repeated 2-3 times a year. Refresher classes in autogenic training are organized during work breaks for all who desire them. Their goal is to remove fatigue and create a cheerful mood.

Another problem is the place where the classes are held. It is necessary to have special rooms which are equipped with soft armchairs, a screen, projection equipment and tape recorders. At the Nytvenskiy Metallurgical Plant, for example, they plan to create "good mood rooms" in each shop. And those which have already been created can serve as a model for these rooms of rest and psychological adjustment. Thus one of the laboratories occupies a space of 45 square meters, the floor is carpeted, the walls are attractively decorated, there are comfortable armchairs and the lighting can be regulated--all this contributes to a cozy, calming situation. Next to this laboratory is the operation room with a control panel. From here they play back the tapes of the autogenic training sessions as well as music, and they also show film materials, slides and colored spots.

In the first classes they discuss the essence of autogenic training and the mechanism for suggestion and autosuggestion. The workers learn that the method is based on muscle relaxation and verbal self-suggestion which amplifies the suggestion from outside. In conversation it is emphasized that everyone can improve his psychological condition and find the path to self-improvement. Autogenic training can be done not only in sessions in good mood laboratories, but also independently, at home. It is necessary to create for oneself beforehand a model of the mood or condition for activity and then, in a condition of relaxation, introduce this model into one's subconscious through verbal formulas. It is as though the suggested conditions independently influence the way one feels and one's behavior.

In each class after the discuss they practice exercises in autogenic training. As practice shows, the optimum is a set of five exercises: physical rest, psychological rest, heaviness of the body, body heat and facial relaxation.

Everyone assumes the position of a passenger in an airplane or a coach, as in classical AT, they close their eyes and calm themselves. During the first two or three sessions they work on the exercises for "physical and psychological rest."

With the exercise for "physical rest" the support formulas are: "I am freeing myself from constraint and tension"; "The muscles of my body are pleasantly relaxed"; "Every one of my muscles is relaxed and limp"....

The support formulas for the exercise "Psychological Rest" are: "All thoughts are leaving"; "I am sinking deeper and deeper into rest"; "Rest has engulfed me like a blanket"; "It is as though I am hanging in air, in a condition of weightlessness"; "I feel as though I have melted"....

After two or three classes the students usually master the technique of physical and psychological relaxation. After this one can begin to learn the next exercises.

The support formulas for the exercise "Weight of Body" are: "My arms are heavy"; "My legs are heavy"; "In my right hand is a heavy bucket"; "My hands are lying on my knees calm, immobile and heavy"....

The support formulas for the exercise "Warmth of Body" are: "I feel a pleasant warmth in my right arm"; "My right arm is immersed in warm sand"; "The sand is warming my right arm"; "The blood vessels in my arm are expanding"; "The warmth is reaching my fingers"; "I have learned to expand the blood vessels in my arm"; "My right arm is warm"....

The support formulas for the exercise "Facial Relaxation" are: "The muscles in my forehead have relaxed"; "The wrinkles on my forehead have smoothed out"; "My eyelids have closed softly"; "The muscles in my neck have relaxed"; "I have cast an internal glance over my face--all muscles in my face are relaxed"; "My lower jaw has dropped slightly"....

During the session the formulas which stimulate the psychological activity of the students are repeated periodically: "You select for yourself the given

condition"; "Repeat the formulas after me, like an echo"; "Repeat in a whisper and feel"; "My voice first appears then disappears, you select the given condition for yourself."

After five or six classes they should change over to suggestions that are directed to solving key problems. Now all of the participants can successfully enter a condition of relaxation and through psychological self-control they can evoke heaviness and warmth of the body and relaxation of the muscles in the face. Then awareness slows up, the negative condition (uneasiness, fear and anxiety) disappears or is dulled, good feelings are created for the suggestion of the directions for the corresponding behavior or directions of a psychohygienic nature. It is these suggestions that comprise the final part of the psychological training session. This sixth exercise of the session is conducted in a differentiated way, depending on the peculiarities of the group. Here are some model formulas of suggestion:

"Group rest, removal of fatigue and optimization of mood: "The tiredness has gone"; "cheerfulness"; "rest"; "freshness"; "I have rested well"; "I am confident"; "I am calm"; "I feel good"....

The group for overcoming uneasiness and anxiety: "I am calm; a calm confidence"; "I am always calm and confident of myself"; "I control myself well"; "I am able to keep myself in hand"; "I speak in a calm and regular way"; "I am patient and restrained"; "I enjoy living"; "I find it pleasant to communicate with people"; "Communication brings me joy"; "I am confident in myself"....

The group for psychological adjustment: "I like classes in autogenic training"; "A good mood"; "Confidence"; "Power"; "Strength"; "Self-Control Helps Me"; "I am ready to act"; "I want to, I am able to, and I will act"....

Each training session ends with coming out of the condition of relaxation. With small pauses the people hear approximately the following words: "I have rested well"; "I feel a lightness throughout my body"; "I feel cheerful and fresh"; "I am full of strength and cheerfulness"; "I will count to 10"; "When I say 10--I will open my eyes"; "One, two, the warmth has gone. Three, four, the heaviness has gone. Five, six, with each breath the warmth and heaviness are leaving"; "My mood is cheerful"; "Seven, eight, I want to, I can and I will carry out all instructions"; "My mood is good, I want to act"; "Nine, ten, a deep sigh. I open my eyes and smile."

All of the recommended formulas are only approximate. Along with them the instructor also offers suggestion in the form of model images. If he is very familiar with the peculiarities of the students, he introduces individual instructions. In the middle of the course the workers can already compose their own forms of suggestion on the basis of their individual peculiarities and condition. The overall requirements for them are an absence of argumentation, brief statements, the command, and the categorical statement.

Autogenic training sessions can be conducted in two ways. The first--the entire course is recorded on tape. The students sit in armchairs and play the next session. They hear a musical background and the voice of the speaker.

The second--the session is conducted by an instructor. The classes can also be accompanied by music.

A comparison of these variants has shown the undoubted advantage of the latter. With a tape recording, of course, one can tape a good musical background, the standard formulas and the speaker's pleasant voice, but playing it back cannot replace the instructor who sees the person and makes the corresponding adjustments in the session. Even the most perfect technique cannot compensate for live, direct contact.

Unfortunately, now not all enterprises have specialists who could conduct the autogenic training sessions in a qualified way and therefore it is necessary to resort to tapes. But even in those cases when the classes are conducted by an instructor it is expedient to organize several sessions in the course on the basis of tapes.

At the enterprises where the research work was done the psychologists of the divisions for scientific organization of labor, under our leadership, learned to conduct autogenic training sessions and organized a psychohygienic service at their production. They are also training workers in the technique of self-control of their psychological condition. The experience of their work confirms the feasibility of applying autogenic training under production conditions.

What is the effectiveness of psychological self-regulation from the standpoint of the workers themselves?

During the course we periodically circulated questionnaires in which we revealed the dynamics of the way they felt and their psychological condition. Here are the generalized data: a reduction of fatigue is indicated by 91 percent, increased ability to work--81 percent, and improved mood--82 percent. Unfortunately there are no methods with which one could evaluate the economic effect of autogenic training. Yet the managers of the shops where the psychological unloading laboratories were functioning stated that there was an increase in the labor productivity of the workers. The psychohygienic service had a positive effect here on stabilization of the personnel as well. All this convinces us of the prospects of organizing "good mood laboratories" at the enterprises, where the workers can use autogenic training to learn to control their psychological condition.

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WAYS OF MAINTAINING PUNCTUALITY SUGGESTED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 193-199

[Article by Ye. I. Komarov, docent at the Institute of Management imeni S. Ordzhonikidze (Moscow): "A Brief Course 'How Not To Be Late'"]

[Text] Observations have shown that it is possible to single out the following types of people who are late:

first--those who have not even left home yet but are already late;

second--those who are late because of all kinds of delays en route;

for the third type--those who are late because of their "playful" memory.

Therefore scientific recommendations like: "Early to bed, early to rise," "Do everything quickly," "Eat less in the morning," "Try not to be late"--These are not very effective because they are impersonal. A recommendation "works" only if it is addressed to someone.

Those Who Have Not Left Home But Are Already Late

One of the main reasons for the tardiness of this type of people is their lack of preparation the night before. Everything is put off until morning. And in the morning it is impossible to do everything even moving as fast as they can.

Another reason for tardiness is that bad but pleasant habit of waking up and then not getting up until the last minute. Although all the alarm clocks have gone off, our sleepyhead continues to postpone getting up. But the time comes, the sleepyhead quickly jumps out of bed and begins the most energetic activities, pushing out of the way everything he can do without: he does not do his exercises, does not brush his teeth, does not iron his trousers, does not polish his shoes, and does not prepare his lunch! He can eat and drink something on the way. Having flown out of the driveway, he begins his "race for time." And he is always short by some 10 minutes! It is too bad that there is no special bank which would give him time loans!

Certain people of this type of one psychological peculiarity: sensing that not much time is left until they leave, they unexpectedly decide to do something under these "compressed conditions." These "hasty distractions" also lead to lateness.

As a rule, for the person "who has not even left home and is already late" at the very height of the morning bustle some "nasty" happenings occur: the water faucet breaks, the lights go out, their shoestrings break, breakfast is burnt, and so forth. All this happens at such a bad time that it stirs up the already crazy tempo of the morning preparations for work. The person becomes so tired from this tempo that he is glad to drag himself onto the bus or, if he succeeds, to work.

The person who has not even left home yet but is already later, having flown out of the driveway, becomes a person "who has already left and is already late."

In the opinion of GAI workers, these citizens present the greatest danger for transportation since through their actions they can at any moment create a dangerous situation in the system of "motor vehicle-pedestrian-road."

Three Rules of the Person Who Leaves Home on Time

The person who leaves home on time has a developed technology for getting ready: he knows what needs to be done, in what order and approximately how much time this will take. Let us single out certain important rules. The first rule: do the maximum number of tasks during the preceding evening. Shoes and clothes are prepared in the evening, the briefcase is packed, lunch is prepared. Everything is laid out, arranged and prepared.

Second Rule: Carry out the procedures for the morning preparations in a certain sequence. Have you noticed how the "person who has not left home yet but is already late" makes his preparations: he jumps from one object to another, grabs the telephone, then a cup of tea, then a brunch, then the iron. There is a chaos of movement, confusion and his head is in a spin. It is time to go but many things have not been done yet and the rate of the preparations has reached its maximum. His mind is still "spinning" in the apartment, but his body is moving away from the home....

The person who leaves home on time has orderly movements and actions because he has become accustomed to a certain order. This habit makes it possible to carry out the procedures for getting ready as though they were automatic, without any special effort. Looking at such a person you understand that the ability not to be late at all depends completely on us ourselves--on our will and efforts.

The third rule: each thing must be in its place. People can object: "God, what a bore! It is better not to live in such a 'dry stereotype'."

A certain number of people "who have not left home yet but are already late" also live according to a "living stereotype": when they come home from work they cheerfully throw their things wherever they fall. Everything remains in

this condition until morning. And during the period of morning preparations the people go through everything in the house a couple of times and are glad about each thing they are able to find....

The person who is not late is not late because he is not looking for anything. Things lie in their places. Try to change over to this "dry" rule and you will be convinced that you will have time for more pleasant things.

Those Who Are Late Because of All Kinds of Delays En Route

Tardy people of this type can be divided into two categories:

1) those who are late because of the poor operation of transportation;

2) those who are secretly late.

3) in the modern city two themes have grown up which literally pilfer time "out of the pockets" of the citizens. These are waiting lines in stores and the poor operation of public transportation. The only kind of transportation that almost never delays a passenger en route is the subway. It works efficiently, promptly and quickly. Therefore it is no wonder that one of the indicators of a "good home" in the city where there is a subway is its location near a subway station.

Citizen S. S. Sidorov goes to work 5 times a week on two kinds of transportation--the bus and the subway. He has calculated that in comparison to the interval of movement which is indicated on the schedule at the bus stop, each day the bus is late by an average of 7 minutes. If we multiply 7 minutes by 24 workers a day we have 168 minutes, that is, each month they "take out of S. S. Sidorov's pocket" 2.68 hours, and during a year (not counting vacation time) 29.48 hours. The figure becomes much more impressive if one includes all those who use public transportation.

All kinds of random transportation mishaps also delay the people who are going to work in the morning. First a trolley will collide with a car, then a streetcar will go off the rails or lose its contact with the wires, or the motor of a bus will die. Swearing, the citizens try to make up for the time that has been lost.

A modern person, trying to combine what is useful with what is pleasant, tries to get to work on his own two feet as much as possible. People not only walk to work, but they also run, ride bicycles, and in the winter they even...ski. The enterprises, institutions and organizations are "catching on" to these changes with extreme difficulty. While a shower seems to become a natural part of the workers' daily life, a place to park bicycles or store skis is still a great rarity. They store their means of transportation wherever they can.

Of course it is somewhat absurd to give recommendations to people who are late because of the poor operation of transportation. This does not really depend on us. Here we need not recommendations, but order in the work of urban passenger transportation. Moreover one should take into account that the

drivers of streetcars, trolleys and buses are also people, and among them there are those who "have not left home yet but are already late." So in this case it is not the transportation itself that is late, but again the people.

Positive examples are always juxtaposed to negative ones. After all, the transportation is the same for everyone, but far from everyone is late. When one becomes acquainted with those who come to work on time one discovers that they are distinguished by their vigilance. They are like sociologists who study the work of the transportation. Therefore the rules to which they adhere are of a certain amount of interest.

The rule of diversity. The people who are not late have various routes to their place of work which combine various kinds of transportation, including pedestrian. Here they have become convinced from their own experience which route is the most reliable and which one lets them down most frequently. And if there is suddenly a delay on one route, they easily change over to another.

The rule of reverse flow. Passenger flows take form in such a way that among them there are direct (dense and crowded) and reverse (weak and uncrowded) ones. Those who are not late prefer the reverse flow over the direct one. This takes a little more time but this is made up for by the peaceful surroundings.

The rule of leaving with time to spare. Certain people who are never late become so accustomed to this that they regard as late a departure from home which is prompt according to ordinary measures. What does this rule do? In the first place, the reserve of time creates a kind of stable psychological condition. You begin to work calmly and attentively. In the second place, if something happens to the transportation this reserve of time always comes to your rescue.

The rule of optimal time. The density of passenger flow on transportation is changing all the time. The selection of the time when the density of the passenger flow is less makes it possible to ease the morning problems on transportation somewhat.

Another category of people who are late because of all kinds of delays en route are those who are "secretly late," those who are not 2, 3 or even 10 minutes late, but come in considerably later--during lunch break or after dinner. How does this happen?

For example, a scientific research institute begins work at 10 and a women's clothing store located not far from the scientific research institute begins at 9. Understandably, a certain number of the women who work at the scientific research institute drop into this store on their way to work. Such "secretly late" people who seem to be at the enterprises, in the ministries, in state committees, in conferences and so forth from morning on are not counted. Because there is a multitude of means by which the prosaic and sometimes also poetic delays en route can be camouflaged.

With respect to those who are "secretly late" there is only one recommendation: strict observance of labor discipline.

Those Who Are Late Because of Their Own "Playful" Memory

They are constantly confusing the days, hours and places of meetings, conferences and so forth. For example, the manager makes an announcement: "The meeting will be on 13 December at 1600 hours in the assembly hall." The person with the "playful" memory recalls it precisely the opposite, that the meeting will be on 16 December at 1300 hours. On that day and hour he comes to the meeting. He waits for a half hour, an hour, and then it dawns on him that the meeting was held on 13 December at 1600 hours. He is late by 3 days!

Any kind of announcements about meetings, conferences, Saturday work days and other "gatherings" turn into an incredible torment for people of this type. By confusing the days and hours they also confuse themselves, their coworkers and the people who live with them. While trying not to be late they are constantly late or do not show up at all when they are supposed to.

The main problem of this type of people is that they do not want to take a pen or pencil and paper and write down where, when and at what time something will take place. They prefer to spend more effort, energy and time but to keep the information in their head. They curse themselves for this but they can find no way of overcoming their contradictory nature. While understanding what they need to do, they do what they have become accustomed to.

Therefore getting rid of this habit is an extremely difficult matter. Knowing their weakness, the manager when giving an oral announcement insist that they take out a pen and paper (if they do not then he gives it to them himself) and write down what, where and at what time something is going to happen. As practice shows, this method could help if the people with the "playful" memory...did not lose their notes.

Managers try to devote special attention to workers with a "playful" memory, constantly reminding them of forthcoming measures either orally or giving them the written notifications.

Certain measures use the method of identical figures. For example, a meeting is scheduled for 16 December at 1600 hours. This, of course, is an organizational fine point. But even here the person with the "playful" memory can "play a trick" with the number: he will come to the meeting either on 16 January or 26 December.

People with the "playful" memory, having finally become tired of these games, try to utilize methods which give the memory certitude and persistence.

The yardstick method. On a large sheet of paper with letters almost as big as a yardstick they write what, where and at what time something is going to take place. These yardstick reminders help them to get to the meetings, conferences, assemblies and so forth on time.

The method of dedication. The essence of the method consists in that the person with the "playful" memory announces to the people with whom he lives that on such-and-such a date at such-and-such an hour he should be, for

example, at a meeting or a Saturday workday. This kind of "delegation of memory" leads to a situation where the concerned household members are constantly reminding him of the date, hour and place. It sometimes happens that they remind him so frequently that they do not even give the person a chance to sleep peacefully at night....

But the most reliable means is still acquiring the simple and useful habit of writing down information and announcements in a weekly book. Then there is no need to resort to the complicated methods which are sometimes used because people forget about the available and effective methods.

Instead of a Conclusion

Since our "course" has a practical direction, the author has a request of those who have decided to follow the recommendations.

In the first place, make note of approximately how much your tardiness has been reduced. This will be the first practice effect from the course.

In the second place, note the change in the way you feel about yourself during morning preparations for work. If it improves this will be the second practical effect of the course.

And so, good luck and good work without being late!

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BOOKS ON COST ANALYSIS REVIEWED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 200-207

[Review by Sh. B. Sverdlik, doctor of economic sciences, laboratory chief of the Novosibirsk Institute of the National Economy, of the book by M. G. Karpunin and B. I. Maydanchik, "Funktsionalno-stoimostnoy analiz v otraslevom upravlenii effektivnostyu" [Functional Cost Analysis in Branch Management of Effectiveness], Moscow, "Ekonomika", 1983]

[Text] From time to time periodical literature reminds us of organizational and economic innovations which at one time shook the entire country but now have been consigned to oblivion or make their way as single examples from one monograph to another. With rare exceptions the path of any innovation from the idea to mass introduction is thorny and filled with potholes, and the innovation must overcome structural, departmental, psychological and other barriers. A factor of no small importance which can either play a role as a catalyst in the introduction of an innovation or transform it into a textbook relic is objective scientific information by means of which local "inventions" become the subject of general publicity.

The dialectic of the development of technical equipment, technology, economics and management is such that any innovation which is directed toward solving one problem, toward the elimination of a particular bottleneck, is not very effective. Exaggeration of the positive effect and silence about the thornier aspects can discredit the very best undertaking, and one-sided advertising does not accelerate mass introduction of a new idea but raises a deaf, impenetrable wall of opposition on its path.

The new work by M. G. Karpunin and B. I. Maydanchik concerning functional cost analysis,¹ fortunately, does not have these shortcomings. The authors have set for themselves a dual task. On the one hand, to generalize the experience in organizing and applying the FSA that has been accumulated in the electrical equipment and certain other branches of industry and to systematize in a form that is convenient for the reader the main theoretical, methodological and organizational points whose observance will make it possible to organically build the FSA into the branch systems of management of expenditures on production and warn developers away from repeating the mistakes that were discovered in the first stages of the introduction of the method. But,

according to the authors, the path of this method to the universal system does not end with the introduction of the FSA into the branches of industry. The second and perhaps more significant goal of the work is to determine the main directions for further development and qualitative improvement of the FSA method and to single out the major problems whose solutions will join various kinds of experience into a unified national economic system or providing for socially necessary expenditures in all stages of the life cycle of the items.²

The structure of the monograph is conditioned by the indicated goals. At the beginning of the book they consider the tasks of branch control of the effectiveness of production, the role of the branch in increasing the final national economic result, and the task of providing for socially necessary expenditures in the various stages of the life cycle of the items. The next three chapters are devoted to scientific generalization of the content of the FSA, the stages in carrying it out and the methods of searching for the most economical solutions. The peculiarities of the application of the FSA in the stages of scientific research and experimental design work in existing production during modernization and unification of items, streamlining of technological processes and improvement of organization and management--these are the subject of special research in Chapters 4-7. The experience in organizing the work for introducing the FSA method in the Ministry of the Electrical Equipment Industry, which was approved in 1982 by a decree of the CPSU Central Committee, is considered in detail in Chapter 8, and in the next one--the experience in applying the FSA in European socialist countries and certain capitalist firms. And, finally, in the last chapter the authors return again to a consideration of the methodological and organizational-economic problems whose solutions will make it possible to transform the FSA into an integrated system for controlling the effectiveness of production on a national economic scale.

The first problem concerns the position and role of the FSA in the early stages of planning large systems and the development of target programs. The authors correctly assert that in the future the greatest effect from the application of the FSA will be achieved if it begins with an investigation of large technical and organizational-economic systems. After this there can be sequential (or sequential-parallel FSA of subsystems of the first and second order and so forth. The FSA of individual items and technological processes and the organization of individual productions, according to this scheme, should be the final stage of the work.

The complicated systems and large target programs are distinguished not only by the large expenditures on their creation and assimilation, but also by the complexity of functioning and the need to solve simultaneously a considerable number of problems, most frequently contradictory ones. The book gives this example. An energy system is a totality of such subdivisions as the fuel complex, an electric power station with complicated equipment, a system for transferring electric energy, a control system, and a large number of consumers with varying degrees of priority for obtaining energy. At the present time the FSA at best affects objects of the turbine or generator type. Yet when analyzing a complicated system it can turn out that a particular one of the subsystems mentioned above is not performing a useful function (or is not performing it completely, is performing it uneconomically, or has a

surplus resource) and it should be eliminated. In this case the expenditures on conducting the FSA relative to small objects of this subsystem can turn out to be a useless waste of effort and money (p 182).

The application of the FSA in the upper stages of planning and management of the national economy should counteract its being transformed into an additional level for pressure of departmental interests on the final results of public production. The Perm Electrical Equipment Plant decided to update its products list--to remove from production engines for the Malyutka washing machine produced by Uralmash, which is small, inexpensive and in great demand. The new engines do not fit well into the tight plastic housing of the Malyutka, there arises a need for additional devices to prevent overheating, and the cost of the item increases while its reliability decreases.³ It is quite possible that the Perm workers justified the need to remove the old engines from production out of considerations of FSA, but the Uralmash workers at the same time have lost forces and money on the overall cheapening of the Malyutka by the same method. The buyers of the Malyutka will have to make up for these useless expenditures.

It is obviously worthwhile to consider attentively the problems raised by the authors of the book. These include the need to search for new organizational forms for conducting the FSA of complicated systems; the need to create interbranch scientific and planning groups (or even entire organizations), which are flexible in structure, number of personnel and composition, for the period of conducting the FSA of complicated systems and the need for interbranch and branch coordination centers for FSA; and the importance of developing criteria of the optimum which should be used for orientation when conducting the FSA, and several others (pp 180-184).

Let us just recall the history of the automated systems for controlling enterprises (ASUP). Under the 9th Five-Year Plan we annually created 168 of these systems, the 10th--78, in 1981--59, in 1982--49.⁴ Many management workers who were questioned by the Kiev scientists stated that the advantage from the ASU is insignificant and certain of them generally consider that the introduction of the ASU reduced the effectiveness of production by increasing expenditures on management personnel and the creation of a computer center.⁵

Should one really be surprised at such disheartening results? During the first years--the years of the boom--there was the opinion that the ASUP consisted of the computer (and the more expensive the better) plus the programmers. The computers and the finances for acquiring them were allotted under a centralized policy, and the programmers were trained in 3-6-month courses. The ministries and departments began to create scientific research and planning organizations for developing the ASU's which were sometimes small but they were their own, and the training of management personnel for work under the conditions of the ASU was turned over to the enthusiasts.

In order not to repeat the mistakes of the ASU one should first apply the FSA to the FSA itself. *Medice, cura te ipsum*--physician, heal thyself.

The second problem is the monetary evaluation of the expenditures which are made or should be made for the fulfillment of the function. Herein lies the

essence of the cost approach of the FSA method as an instrument for economic management of the effectiveness of production. "...The FSA is a totality of actions...directed toward discovering, preventing, reducing or eliminating excess expenditures" (p 29). When speaking about unnecessary functions it is not so important what they cost: an unnecessary part has been removed, the configuration of another part has been simplified--and the savings on expenditures are there. It is another matter when a new function can be manifested in another way or a known set of different ways from what exists in practice, in production and so forth. In these cases it is necessary to determine the possible and actual expenditures, the maximum permissible expenditures and what the expenditures would be for carrying out the function if they were manifested with the other method (p 38).

Expenditures on a function is quite a new concept in the theory and practice of accounting for and planning expenditures on production and calculating production costs.

The calculation unit in the majority of branches of industry is the item, and only for large items with unit output with a lengthy production cycle are the calculation and accounting for expenditures done for individual technological units and aggregates which are completed structures. At enterprises with large products lists the planning and reporting calculations for items are drawn up only for the most important kinds of them, and for the rest they are drawn up for groups of the same kinds and individual standard representatives of these groups. The deciphering of the material expenditures for the various kinds of materials and batching items is done only for the most important kinds of products.

The ideal situation would be one in which the planner could find in the reference works the normative (maximum) cost of performing one function or another and those maximum expenditures which he should use as orientation when searching for new decisions. But such references have not been created and the evaluation of functions entails serious difficulties, and therefore it depends to a considerable degree upon the individual creative capabilities of the specialist (p 39).

Creative capabilities are good but reliable information is better. Or, rather, creative capabilities should be based on a realistic evaluation of the actual "cost" of the function as a whole and of its constituent parts--youthful and surplus expenditures. One can say whatever one wants to about planning from what has been achieved, but it is precisely information from what has been "achieved" that has been, is and will remain the main source of knowledge of an object and a standard for evaluating the plan. The lack of reliable information about the actual expenditures on functions opens up a broad space for all kinds of manipulation of figures, the more so since efficiency experts and inventors, as a rule, are inclined to overestimate the positive results of their suggestions and underestimate the expenditures on their realization.

But the major difficulty is that in complicated items individual parts and components, as a rule, perform several functions and each function is carried out with a multitude of parts and components. Therefore strict "bookkeeping"

devices for calculating and reporting expenditures on an item and its assembled units must be augmented by easier and less labor-intensive methods of breaking down the aforementioned expenditures according to their functions. In the USSR and abroad we have accumulated a certain amount of experience in determining and analyzing expenditures on the performance of functions, but many methodological and organizational problems still need to be solved.⁶

An essential element of the cost approach of the FSA method is the exchange of information among producers of the same kind of products, on the one hand, and among producers and consumers of the products, on the other. In the final analysis any search for reserves for reducing expenditures amounts to a comparison of parameters of the analyzed object with parameters of a real or "ideal" (model) object with comparable functions. It is possible to take into account the national economic effectiveness of new solutions only when analyzing total expenditures--production and operational. During the life cycle of automotive equipment the operational expenditures exceed severalfold (and sometimes tens of times) the expenditures on production (see EKO, No 12, 1984, p 155). The presently existing direct and reverse informal ties are suitable when the producer produces the lion's share of a given item and deals with a limited number of consumers of his product. But what happens in cases when a product with the same kind of functional purposes is produced in dozens of enterprises and is used in many branches? The problem is not a new one, but its lack of a solution is impeding extensive application of methods of interbranch comparative analysis which were developed as early as the 1970's; it has already become a stumbling block on the path of the FSA. Yet each ministry has created centers for scientific and technical information which should be responsible for publishing job reference books concerning production and operational expenditures on the various items in large-series and mass production. It would seem that the publication of such reference works would be less expensive to the state than "amateur" searching for information by individual enterprises for comparative analysis in general and for the FSA in particular.

And, finally, the third problem has to do with personnel for the FSA. Hardly anyone would argue with the idea presented in the book that the underlying basis for the FSA is "the selection of skilled, creative specialists who have a certain amount of engineering and economic knowledge and knowledge in the area of preparation and organization of production, who are convinced of the high results of the FSA, and who are capable of becoming the organizing center, the support for the management of the enterprise (organization) in publicizing and introducing the method, the nucleus of the research groups for the FSA (p 54).

However FSA specialists are not born; they must be trained. The program of personnel support for the FSA which is suggested by the authors envisions teaching FSA principles to a broad range of managers of ministries, departments, associations, scientific research institutes and design bureaus, training specialists and leaders of FSA groups as well as teachers and methodologists, and including FSA subjects in training programs of VUZes in the form of individual sections and subjects in courses in planning, technology, production organization and analysis of economic activity, and in the training plans of certain specialties--in the form of an independent

discipline (pp 185-186). The implementation of the aforementioned program, in turn, will require organizing a system of special courses for retraining designers, technologists and economists of enterprises as well as teachers in VUZes and institutes for increasing qualifications, it would be necessary to publish textbooks, training and methodological aids, and so forth.

As an ardent proponent of the FSA I fully agree with this program-maximum. But as a VUZ teacher with many years of experience I am afraid that its implementation will drag out for many years and will drown in a sea of paperwork and the abyss of coordinating it all. What seems more rational to me is the path from quality to quantity, and not the reverse. Let each ministry and department organize the FSA at one association or enterprise, but in full volume and with the proper personnel, information and methodological support. Subsequently one can use the example of this base enterprise to teach FSA methods to specialists of five-six more enterprises and turn them into base enterprises for the next group of students. Incidentally, it is preferable to retrain teachers in VUZes also at base enterprises where, as distinct from the IPK and FPK, the results of the application of the FSA method can be seen in person and, as we know, this is 100 times better than even the best retelling.

In conclusion let us note that the book under review is intended for two categories of readers. For beginners it will be a good systematized aid which augments the scanty information about the FSA contained in textbooks on analyzing economic activity. The glossary of terms and the extensive bibliography contained at the end of the book will contribute to this. The readers who from practice or from written sources have already "come down with" the FSA will find in the book rich material for reflection and creative research in this new and extremely promising area of technical and economic analysis.

FOOTNOTES

1. This book generalizes and develops ideas presented by the authors in earlier published works and, particularly, in the collective monograph edited by them, "Osnovy funktsionalno-stoimostnogo analiza" [Fundamentals of Functional Cost Analysis] (Moscow, "Energia", 1980).
2. The practice of utilizing the FSA in the electrical equipment industry has already been discussed on the pages of EKO. In a selection of materials under the general heading "Functional Cost Analysis--A Method of Economy and Thriftiness" they also published articles by M. G. Karpunin and V. I. Maydanchik (see No 6 for 1981).
3. See PRAVDA, 10 January 1985.
4. "The USSR National Economy in 1982," Moscow, "Finansy i statistika", 1983, p 94.
5. See EKONOMICHESKAYA GAZETA, No 1, 1985, p 14.

6. These problems are considered in detail by the authors of the collective monograph "Functional Cost Analysis in the Electrical Equipment Industry" ed. by M. G. Karpunin (Moscow, Energoatomizdat, 1984) in which they rely mainly on practical issues in the introduction of the FSA. Concrete examples of conducting the FSA that are given here essentially augment the theoretical points of the book under review.

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BOOK ON U.S. ECONOMIC POSITION REVIEWED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 207-212

[Review by S. V. Kazantsev, candidate of economic sciences, Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk) of the book by Zakhmatov, M. I., "SShA: Oslavleniye mezhdunarodnykh ekonomicheskikh pozitsiy" [The United States: Weakening of International Economic Positions], Moscow, "Nauka", 1984, 255 pp]

[Text] V. I. Lenin pointed out that it is a law of capitalist production that means of production are constantly being transformed.¹ The basis of the transformation are the development and replacement of existing technological processes and systems of machines with more effective ones, that is, technological process. A retardation of the speed inevitably leads to a decline of the growth rates, and a weakening and forfeiture of previously won economic positions.

A clear confirmation of this point is the extremely rich factual material presented in the book by M. I. Zakhmatov.² The author shows that the struggle for leadership today is a struggle for technological progress, for technical leadership.

The international positions won by the United States after World War II are still fairly high. This country still has the largest economic and scientific-technical potential in the capitalist world and continues to lead in productions associated with military and space technology which are distinguished by their high science-intensiveness, as well as in the production of computer equipment.

The United States in maintaining scientific and technical leadership in the creation of computers and software for them, in laser technology, in the aviation and space industry, and in bioengineering. The economic potential that has been accumulated and the advanced technology make it possible for them to win out over their competitors in many areas of economic life. In 1983 the U.S. share of industrial production in the developed capitalist countries amounted to 37 percent (the share of the EEC countries--35 percent, Japan--16 percent), on the semiconductor market--55 percent, and the export of

aircraft--more than 50 percent.³ As usual, the United States holds first place in the capitalist world in the production and export of electronic equipment and second place in the smelting of steel and the exporting of machines and equipment. In 1984 it again took first place in the number of automobiles produced.

But the main competitors of the United States--Japan and the countries of Western Europe--are increasingly reducing the technological gap in many spheres of production and they have already limited it with respect to the utilization of certain kinds of progressive technologies. This pertains first and foremost to such once-basic branches of economic development as the automotive and steel-smelting branches. Having introduced industrial manipulators and flexible production systems into the automotive industry, Japan achieved higher labor productivity. It takes 100 fewer man-hours to assemble an automobile in Japan than it does in the United States (p 60). The Japanese worker in the automotive industry produces an average of about 60 motor vehicles a year while the American produces 20.⁴ As a result, Japan is increasing the output of motor vehicles at more rapid rates than the United States is and is crowding out its competitors across the ocean both in the world automotive market and in the American market.

In 1979 Japanese automotive firms took over 20 percent of the American automobile market (p 69) and in 1984 more than 30 percent of this market was already in the hands of the well-known Japanese companies Toyota, Nissan and Honda.⁵

Labor productivity in the steel-smelting industry in the United States, according to the estimates of Japanese specialists, is 77 percent of what it is in Japan (p 65). This makes it possible for Japanese companies to increase deliveries of steel to the United States. Certain Western European countries are taking this same path. As a result of the deterioration of the technological positions in the steel-smelting industry, the proportion of imported steel in the overall volume of its consumption in the United States exceeded 20 percent, which is greater than the share of the largest American company, U.S. Steel Corporation.

The branches considered above were traditionally in the United States the leaders of technical progress, which also included the skills of the workers, wages and organization of labor. Therefore it is no wonder that many leading forms of organization of production, management and wages originated in the United States precisely in these branches.

Now the scientific and technical image of any country is determined by electronics, robot technology, petrochemistry, biotechnology and information systems. And it is precisely in these areas, as M. I. Zakhmatov's books shows us, that the United States has either lost or is losing its leadership. Thus labor productivity in the production of electrical equipment items in the United States is 98 percent of the analogous indicator in Japan, and in the petrochemical industry (76 percent) (p 65).

Electronic computer equipment serves as an indicator of the highest scientific and technical achievements in the modern world. Ever since 1946 when

associates of the University of Pennsylvania, Presper Eckert and John Mauchly invented the electric computer, the United States has maintained preeminence in this area (especially in software). But the difference between this country and its competitors is gradually decreasing. In 1979 Japan took over 42 percent of the capitalist market for microsemiconductor integrated circuits while the American firms were unable to satisfy the demand for "16K REM" memory circuits (p 75). Japanese producers took all orders that were not satisfied by the Americans. Since that time Japan has actively been attacking U.S. positions in the production and sales of electronic computer equipment.

Programs for computerization are given broad state support in Japan. Here one sees manifested, in particular, one of the typical features of modern state monopolistic capitalism--active participation of the state in scientific and technical progress and the dissemination of its results. "The state is replacing private capital at the cradle of modern technical progress."⁶

The modern capitalist state influences scientific and technical progress through state programs (nationwide and branch), financial incentives (the tax policy, direct financial support, joint participation in expenditures and profit), influence on market conditions and the market mechanism (orders for new technical equipment, the introduction of standards, control over product quality), the creation of state scientific research laboratories,⁷ the transfer of new technologies and developments to private firms, the exchange of scientific developments and technology among branches, and so forth.

Which method of influence is preferred in one or another capitalist state? In Japan and the FRG these are mainly measures of financial stimulation and state programs, in France--direct assistance to firms in carrying out scientific research and experimental design work, and in England--state laboratories (see table).

Table--Structure of Financial Expenditures on Incentives
for Innovations, % of total

<u>Methods of Influencing Scientific and Technical Progress</u>	<u>Japan</u>	<u>FRG</u>	<u>France</u>	<u>England</u>
State programs ^a	31.2	34.7	8.0	20.4
State laboratories	--	2.2	--	63.0
Direct assistance to firms in conducting scientific research and experimental design work	12.6	9.3	75.5	--
Assistance to research centers	--	4.9	2.8	14.2
Measures for financial incentive	45.0	34.5	--	--
Influence on the firms' industrial policies	--	14.4	1.0	--
Other	11.2	--	12.7	2.4

The United States typically influences the market mechanism and transfers to private firms technologies that have been developed in the state sector. They also carry out state programs which provide for resource independence, increased labor productivity, the development of the infrastructure and so forth. The Reagan administration, following a course toward reducing state

intervention in the economy, is consistently cutting state expenditures on scientific research and experimental design work. According to estimates the share of state funds in the overall allocations for scientific research and experimental design work in the processing industry amounted to an average of 32 percent in 1981-1983 as compared to 52 percent during 1961-1970.⁸

At the same time the state's role in the military sphere is not only not decreasing, but is growing. In 1985 the Reagan administration intends to spend \$34 billion on military scientific research and experimental design work, that is, 25.9 percent more than in 1984.⁹

If the author were to republish this book we should like him to devote special attention to the role of the state in carrying out scientific and technical progress.

Extensive introduction of robots into production is a new stage in the scientific and technical revolution. Apparently the growth of labor productivity and increased production effectiveness will be predetermined in the future to a considerable degree by the scale of robotization of production. Even today one robot replaces an average of four people and essentially reduces production costs. As N. I. Zakhmatov notes, "the potential possibilities of increasing labor productivity on the basis of this latest technical equipment, according to the estimates of experts, are the greatest since the invention of electricity" (p 81).

Extensive robotization of production in the capitalist countries entails an immense social disaster--unemployment. According to estimates, in U.S. industry from 65 to 75 percent of the overall number of workers can be replaced by robots (p 79).

Noting the aggravation of the interimperialist struggle for foreign markets, M. I. Zakhmatov showed how consistently the U.S. positions are deteriorating in world capitalist trade and in all spheres of exporting of capital. There is also an increase in the economic expansion of countries that are achieving acceleration of technical progress (Japan, the FRG, France). Thus Japan, relying on its own rapidly growing technological potential, in a relatively short period of time has made its way into the domestic markets of highly developed capitalist and developing countries. In spite of the protectionist measures taken by the Washington administration, the U.S. deficit in trade with Japan amounted to \$33 billion in 1984 (that is, more than one-third of their total foreign trade deficit), in 1975 it was equal to \$1.7 billion, and in 1970--\$0.3 billion.

Modern technical progress requires significant capital investments. Therefore it is no wonder that it is proceeding more rapidly in countries with a high norm of accumulation in the gross national product--in Japan and the FRG (in 1984 the norm of accumulation in Japan was 30.4 percent)--and less in the countries with a relatively low norm of accumulation--in the United States (16.7 percent) and England (13.9 percent). This aspect of technical progress in the economic life of capitalist countries is also noted in the book under review.

On the whole M. I. Zakhmatov's monograph clearly shows that a retardation of the rates of technical progress and a reduction of the technological disparity between the United States and their main competitors are leading to a weakening of the U.S. economic positions in the modern world.

The questions raised in the book and facts that are adduced cause one to think about the role of technical progress, the attitude toward it on the part of the state and the society as a whole, and the interconnections between the rates of scientific and technical progress and the rates of economic growth. An analysis of the relationships between the level of scientific and technical development of the leading capitalist countries, their positions in the capitalist market, their positions in world exports of capital and their political role--all this, in our opinion, will be interesting to many readers.

FOOTNOTES

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2. Zakhmatov, M. I. "SShA: Oslavleniye mezhdunarodnykh ekonomicheskikh pozitsiy," Moscow, "Nauka", 1984, 255 pp.
3. Goryunov, F. "In Terms of Economic Power and Capital," an appendix to the journal NOVOYE VREMYA, 1984, pp 8-10.
4. Vdovin, Yu. "Robots Against Workers," PRAVDA, 11 January 1984.
5. Barakhta, B. "Sluggish Trading," PRAVDA, 3 March 1984.
6. "Politicheskaya ekonomiya sovremennogo monopolisticheskogo kapitalizma" [The Political Economy of Modern Monopolistic Capitalism], Moscow, "Mysl", 1971, Part I, p 427.
7. The first industrial scientific research laboratory was founded in 1900 in England.
8. Stepanov, M. V., "Scientific Research and Experimental Design Work in U.S. Machine Building," SShA: EKONOMIKA, POLITIKA, IDEOLOGIYA, No 9, 1984, p 100.
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PROBLEMS OF PROCRASTINATION SATIRIZED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 12, Dec 85 pp 213-215

[Article by Mikhail Krivich and Olgert Olgin: "A New Year's Tale"]

[Text] Only a couple of hours are left before the end of the fourth quarter and the director of N Plant for Useful Technical Items has lost all hope of fulfilling the annual plan.

A strong labor collective has been formed at the plant. The enterprise has been operating smoothly and rhythmically. The production managers have provided skillful leadership. The production capacities have made it possible to fulfill the assignments with respect to all of the indicators.

There is no doubt that the plant would have completed the year successfully and on top of things if the supplies of round rolled wire had not run out. But without it, as any technically intelligent person can see, one cannot produce useful technical items.

The plant director, a large man with graying temples, has done everything he could. The kindly secretary in her severe suit has connected him by long distance to the higher and planning organizations. From them the director received an always kind-hearted but firm rejection. The last conference of the year had just come to an end. Its participants had gone there various ways, noiselessly walking down the carpeted hallway.

The director was the last to leave the office.

Having dismissed his driver he walked through the streets of his native city of N, where he had grown up, gotten married and traveled the difficult path from a floating worker to the director of a plant that produces every fifth useful technical item in the country.

It started to get dark. Evening came, the stars shone, the ice cracked underfoot in the yard. The director walked through the street, he was turning blue and shivering all over even though he was dressed quite appropriately for the season--in a muskrat hat and a sheepskin fur. He was shivering from bitterness and from being upset, for the rolled wire had not been ordered for

the plant until the second quarter of the next year, that is, for April at the very earliest....

He walked past the new construction sites where behind the brightly lit windows his fellow countrymen, in keeping with the local custom, were loading champagne into the refrigerators. The director recalled a good tradition--to place at the foot of the beautiful fir tree in the Palace of Culture the above-plan items from their own production. But there was no rolled wire--there would be no decorations for the plant's main tree....

Deep in thought the director did not notice that he had gone past the city limits and ended up in a dense forest. And when he decided to turn back he decided that he had gotten lost. It was snowing heavily, it began to come down in large flakes, and the wind began to howl through the ancient tree trunks. The director wandered wherever his eyes led him, indifferent to his fate....

In front of him suddenly there was a light, the wind died down, and the snow stopped falling. The director walked toward the light and ended up in a forest meadow. Logs were crackling on a fire, the sparks were flying upward and around the fire sat pleasant-looking men, some of them on tree stumps, some of them on a fir tree bough and some of them right on the snow, about 12 in all. A few more stumps were covered with a newspaper, and not the local small one, but a fat literary newspaper. Spread out on the newspaper were light hors d'oeuvres and, believe it or not, nothing else. The men were singing. They were singing smoothly, with good voices, to the verses of Marshak:

Burn, burn brighter--
Summer will be hotter,
And winter will be warmer,
And spring will be nicer.
Burn, burn clearly,
So that it will not go out!

"They are singing from the heart," the director thought. "Not at all like the plant vocal-instrumental ensemble, the 'N Boys'." Suddenly he understood that he had been witness to a natural phenomenon that was extremely rare and therefore questionable in the eyes of certain scientists--the annual meeting with the participation of all 12 months at the end of the fourth quarter.

Having sized up the situation the director walked toward the bonfire and gave season's greetings. He was greeted politely, they brought up a stump for him, and they wanted to know what was bothering him. Why on an evening such as this was he not sitting at home with his family? And the director briefly told those gathered there about the temporary difficulties being experienced by the enterprises that was entrusted to him.

"Things are going badly for you, director," said Brother January, a middle-aged man in a white sheepskin. "Now is not the time to expend funds from the second quarter. You will have to wait until Brother April arrives with the hubbub of the birds, the laughing brooks and the early spring flowers."

"You have become quite sad, Director."

Having seen this, the brother months conferred with each other and came to a unanimous opinion. January gave his staff to February, February--to March, and March--to the young, bare-headed April. He took the staff, struck it on the ground and ordered:

Start running, streams,
Spread out, puddles
Crawl in, ants,
After winter's frosts.
The bear makes his way
Along the thawed patches of forest.
You will have your wire
In this quarter!

Everything around him was transformed before the very eyes of the amazed director. The snow melted, the brooks began to babble, the hibernating bear crawled out of his cave, the land was covered with green and all around with the first early spring flowers there appeared supplies of round rolled wire....

The long and short of it is that by the end of the fourth quarter, when the minute hand on the clock in the hallway had completed its last rotation, the N Plant for Useful Technical Items had fulfilled the annual plan with respect to all the indicators.

Since that time direct contractual ties have been established between the plant represented by its director and the brother months. Now the director is in no hurry to call the higher agencies or write to the planning agencies, and if something is not going right he goes directly to the meadow in order to solve the problem in keeping with the work policy.

And the problem is solved in keeping with the work policy.

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